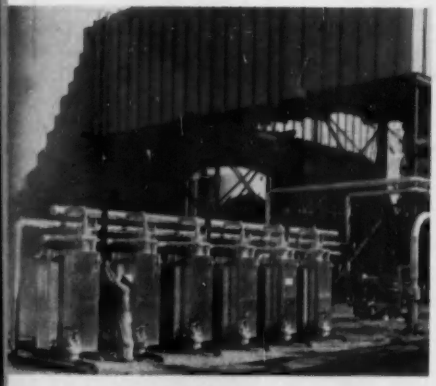
ELECTRICAL WEST

January 1955
25 Cents

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U.S.



Saguaro Is Key Plant 68

New Line Integrates System 71

West's New UL Ready for Region's Growth 61

Every Time 86

Cleaning and Painting Transformers 72

New Developments in Aluminum Connectors 74

Wires Strung Under Tension 77

Florida Comes to Las Vegas 78

Let's Make Adequate Wiring "Human" 83

Cinderella Never Had It So Good 91

Space Heating Desirable Load 65

Note to electrical appliance dealers in Central and Southern California:

With this book in hand . . .
we're going all out to hit
the "best seller" list
in 1955.
Come along—there's big
money in it for you!

SOUTHERN
CALIFORNIA
EDISON
COMPANY

AVY

AGES

→QUALITY LIGHTING

n. SMOOT-
ures are
concentric
eatest
llumination.
for the
ng. Dust
or advance-
by the State
s EARTH-
SMOOT-
res to your
UALITY"—

168 TROFFER

OFFICES

COLLEGIATE

SCHOOLS-OFFICES

INDUSTRO-LUX

FACTORIES

MASTER

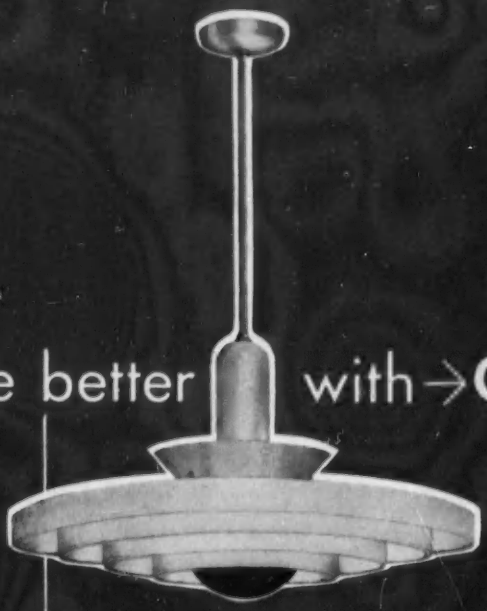
FLOODLITE AREAS

SALES OFFICES IN MOST PRINCIPAL CITIES • BRANCH OFFICE—WAREHOUSE SAN FRANCISCO

Note to electrical appliance dealers in Central and Southern California:

With this book in hand . . .
we're going all out to hit
the "best seller" list
in 1955.
Come along—there's big
money in it for you!

SOUTHERN
CALIFORNIA
EDISON
COMPANY



See better with→QUALITY LIGHTING

Vision is a source of knowledge. To increase learning ability, increase vision. SMOOT-HOLMAN "QUALITY" lighting fixtures are engineered for the classroom. Sturdy concentric rings of the CIRCL-LITE offer the greatest efficiency of low-brightness indirect illumination. A comfortable, better controlled light for the rigid requirements of classroom seeing. Dust free, contemporary designs are a major advancement of classroom beauty. Approved by the State of California Division of Architects as EARTHQUAKE PROOF. You can apply other SMOOT-HOLMAN "QUALITY" lighting fixtures to your lighting needs. Specify and Install "QUALITY"—THERE IS A DIFFERENCE—

168 TROFFER

OFFICES

COLLEGIATE

SCHOOLS-OFFICES

INDUSTRO-LUX

FACTORIES

MASTER

FLOODLITE AREAS

SALES OFFICES IN MOST PRINCIPAL CITIES • BRANCH OFFICE—WAREHOUSE SAN FRANCISCO

JANUARY 1955

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright, Sixty-eighth year of publication.

VOL. 114
NO. 1

ELECTRICAL WEST

George C. Tenney, Editor
W. A. Cyr, Associate Editor
Peggy Boyer, Associate Editor
Walter C. Heston, Engineering Editor
John Cootz, Typography

Next Month

Nineteen Fifty - Four has passed and everyone is thinking in terms of what 1955 holds forth. The February statistical and construction review issue of Electrical West will answer that question for the electrical utility industry in the Far West.

There was some slowdown in construction schedules the past year, just how much dollarwise is not known at this writing. From the general economic outlook and early returns on expenditures and budgets, it would appear that utility spending will be up appreciably over 1954 actual expenditures.

Electrical West's exclusive calendar of new generation to be brought in is continued this year.

In addition to the accomplishments and outlook for the Far West, there will be the usual national statistics for the industry.

Plans of utility sales managers will be presented in the March issue. With emphasis on load building, new activities and new sales programs are in the making. A preliminary report on these will be found in the February issue.

New things are in store in the major appliance field. Look for some interesting developments as reported in the news letter.

Trade notes, news and other regular features will be found in the important February issue.

CONTENTS

West's New UL Ready for Region's Growth 61

ENGINEERING

Space Heating Proves Desirable Load by L. M. Stinson .. 65
Saguaro Is Key Plant by Walter T. Lucking 68
All-Aluminum Favored 70
New Line Integrates Montana System 71
Cleaning and Painting Transformers by Henry M. Hoffman 72
New Developments in Aluminum Connectors by Richard Harap 74
Wires Strung Under Tension 77

LIGHTING AND WIRING

Florida Comes to Las Vegas 78
Let's Make Adequate Wiring "Human" 83

SALES

Every Time 86
Pictures Worth a Thousand Prospects 92

DEPARTMENTS

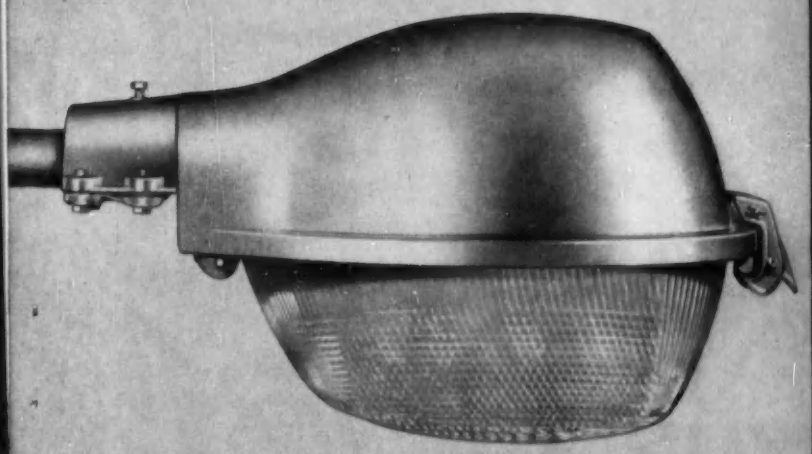
Associations	107	New Products	30
Bulletins	56	News	118
Contractors' News Letter	79	Northwest Data Sheet	94
Editorials	84	PCEA	116
Electra's Husband	58	Sales Guide News Letter	87
Letters to the Editor	26	Advertising Index	136

ADVERTISING REPRESENTATIVES

Chicago (11) ..... Michael I. O'Connell, 520 N. Michigan Ave.
Los Angeles (17) ..... Carl Dysinger, 1111 Wilshire Blvd., MA 6-4323
New York (36) ..... Walter Klein, 330 W. 42nd St.
San Francisco (4) ..... Tom Carmody, Dick Alcorn, 68 Post St., DO 2-4600
Offices: Atlanta, Boston, Cleveland, Dallas, Detroit, Philadelphia, Pittsburgh, St. Louis

THE ELECTRICAL WEST EDITORIAL ADVISORY BOARD—UTILITIES: N. R. Sutherland, Vice-President and General Manager, Pacific Gas and Electric Company, San Francisco; J. A. Hale, Vice-President, Utah Power & Light Company, Salt Lake City; Glenn L. Jackson, Vice-President, the California Oregon Power Company, Medford; Kinsey M. Robinson, President, Washington Water Power Company, Spokane; J. H. Polhemus, President and General Manager, Portland General Electric Company; W. C. Mullendore, Chairman, Board of Directors, Southern California Edison Co. Ltd., Los Angeles. MANUFACTURERS: J. H. Pengilly, Executive Vice-President, Square D Company, Los Angeles; Walter Maytham, Vice-President, Westinghouse Electric Corporation, San Francisco; Ray Turnbull, Vice-President, General Electric Company, San Francisco. WHOLESALERS: A. H. Meyer, Lec J. Meyberg Co., San Francisco; Harry C. Gerster, Vice-President, General Electric Supply Co., Los Angeles. CONTRACTORS: George Abbett, Abbett Electric Corp., San Francisco; Don Larson, manager, Rocky Mt. Chapter,, NECA, Denver. DEALERS: K. L. Hampton, manager, Valley Electrical Supply Company, Fresno; J. C. Chamberlain, Sec.-Mgr., Bureau of Home Appliances of San Diego County, San Diego, California.

ELECTRICAL WEST (with which is consolidated The Journal of Electricity). JANUARY 1955. Vol. 114, No. 1. Published by McGraw-Hill Company of California. **Publication office, 1111 Wilshire Blvd., Los Angeles 17, Calif. Executive, Editorial and Advertising Offices: 68 Post St., San Francisco 4, Calif.** James H. McGraw (1860-1948), Founder; Donald C. McGraw, Chairman of the Board; George C. Tenney, President; John W. Otterson, Vice-President; B. M. Boccoli, Secretary and Treasurer. **Subscriptions: Address correspondence to Electrical West—Subscription Service, 68 Post St., San Francisco 4, Calif. Allow 30 days for change of address. Please indicate position and company connection on all subscription orders.** Single copies 25c. Subscription rates—U. S. possessions and Latin American Republics: $2 a year; $3 for two years; $4 for three years. Canada $2.50 a year; $5 for three years. All other countries $3 a year; $5 for two years; $6 for three years. Entered as second class matter April 17, 1947, at the post office at Los Angeles, Calif., under the act of March 3, 1879. Printed in U.S.A. Copyright 1955 by McGraw-Hill Company of California. All rights reserved.



L-M's new mercury vapor Ovalite has high co-efficient of utilization on the street side, with a choice of types III or IV asymmetric light distribution merely by changing glassware.

Lamp and socket swing down, become automatically de-energized for quick, Service-Safe re-lamping during circuit operation.

Wiping-action contacts open circuit on multiple unit . . .

Now Quick Re-Lamping Possible with Ovalite's Automatic De-Energizing Feature

New Service-Safe design automatically isolates lamp and socket from circuit. As luminaire is closed, circuit is completed by means of wiping-action silver-plated beryllium copper contacts.

By **STACY STANDLEY**
Manager of Lighting Sales
Line Material Company

Here's a new feature in luminaire design that offers savings in servicing. L-M's Ovalite lamp and socket are automatically de-energized and isolated to provide quick, safe re-lamping of the luminaire during circuit operation.

The lamp and socket are part of the refractor assembly. On this multiple unit, wiping-action contacts open as the assembly is swung down, isolating the lamp and socket from the circuit and providing easy, safe access to the luminaire. The wiping action keeps the contacts clean.

The Service-Safe feature is also available on L-M's series Ovalite. This series Ovalite has a shunting make-before-break action.

Other Outstanding Features of L-M's Ovalite

Choice of type III or IV light-distribution pattern by simply changing the glassware.

High co-efficient of utilization on street side.

Latch automatically assures positive closing of luminaire when refractor is pushed up.

Both latch and hinge have a spring action to hold the refractor firmly against the gasket, assuring a bugproof, dustproof, and weatherproof seal.

Complete refractor assembly can be removed easily when desired, cannot be accidentally unhooked.

Hood is a smoothly finished one-piece aluminum casting.

One-piece aluminum reflector.

All hardware is stainless steel or non-ferrous metal.

No trapped light at the glassware junction.

Reflector and refractor are easily cleaned.

Get Complete Information

Ask the L-M Field Engineer or Lighting Engineer for information on the new L-M Ovalite, and on L-M's Lighting Recommendation Service. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division.)

"Ovalite" and "Service-Safe" are Line Material Company trademarks.

212

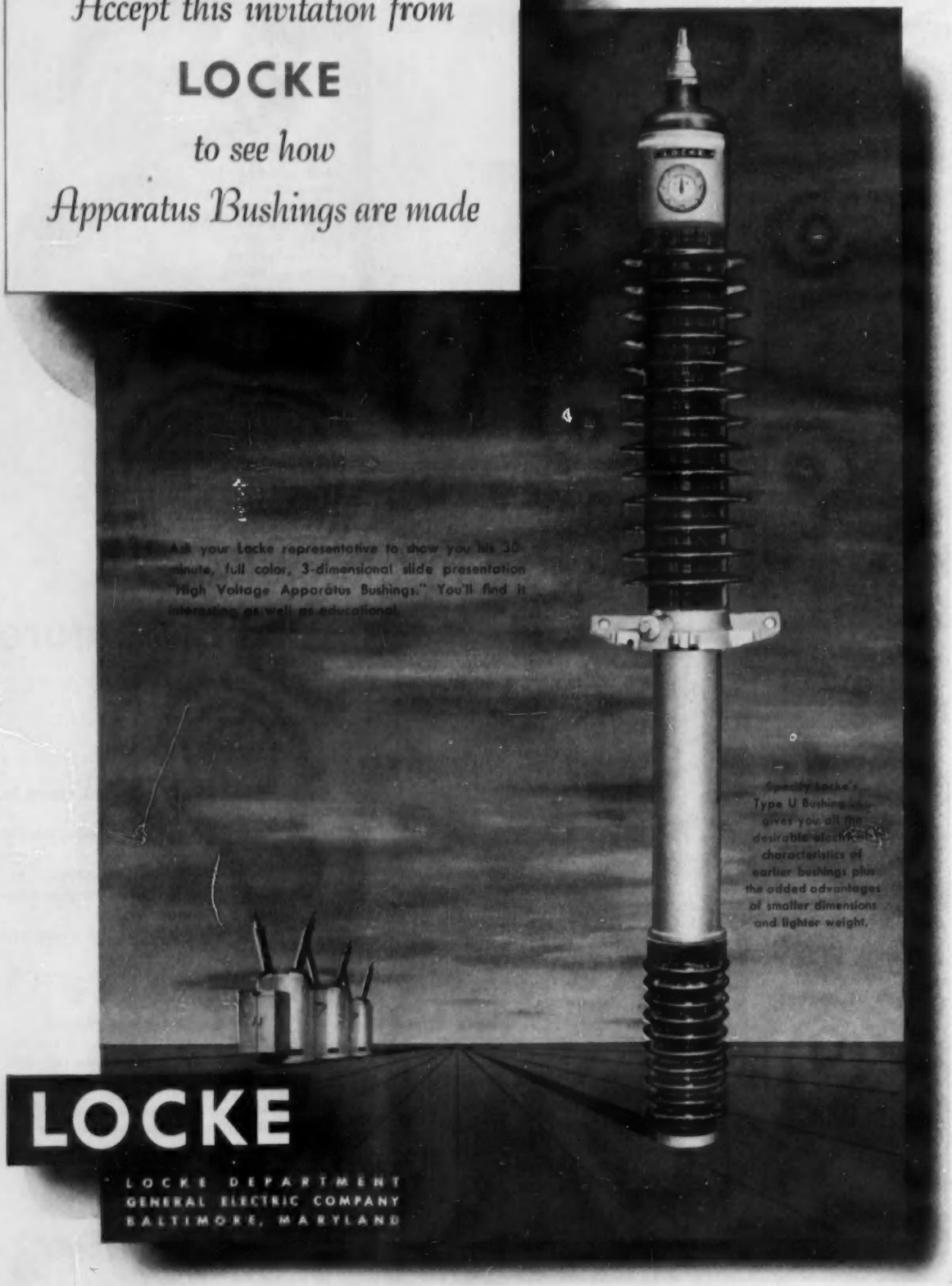
LINE MATERIAL *Street Lighting*

Accept this invitation from

LOCKE

to see how

Apparatus Bushings are made


Ask your Locke representative to show you his 30-minute, full color, 3-dimensional slide presentation "High Voltage Apparatus Bushings." You'll find it interesting as well as educational.
Specify Locke's Type U Bushing and gives you all the desirable electrical characteristics of earlier bushings plus the added advantages of smaller dimensions and lighter weight.

LOCKE

LOCKE DEPARTMENT
GENERAL ELECTRIC COMPANY
BALTIMORE, MARYLAND

This forming operation at Gilro Machine & Stamping Co., Oakland, Calif., is typical of applications where it pays to select the one right steel. Beginning in the open hearth, steel from USS is made to do one specific job and do it best at lowest cost.

You can save money
USING THE ONE RIGHT STEEL!

For every job, there is *one particular steel* that best suits the need. Evaluating your requirements and interpreting them into steel is our business. Forming, drawing, stamping, rolling, bending, painting —these are all things to be considered.

And with the one right steel you get more efficient production, fewer rejects, higher quality in your finished product.

Isn't there some place in your plant where the one right steel could be saving you money today? One call to a Columbia-Geneva Technical Field Representative could be the answer to your problem.

Free!

UNITED STATES STEEL CORPORATION—COLUMBIA-GENEVA STEEL DIVISION
1403 RUSS BUILDING, SAN FRANCISCO 6, CALIFORNIA EW-1

Please send me your free wall chart showing weights, standard sizes, and gauges of steel sheets.

*Name*_____

*Address*_____

*City*_____ *State*_____

USS

USS Steel Sheets

United States Steel Corporation • Columbia-Geneva Steel Division

UNITED STATES STEEL

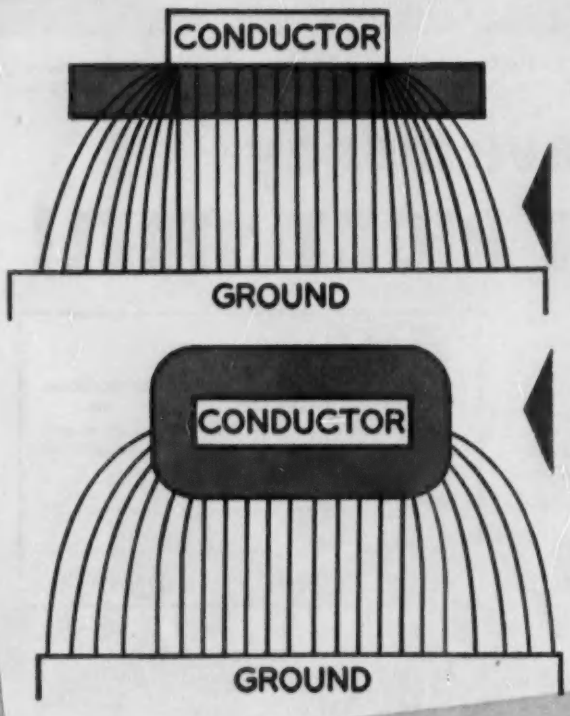
Why Worry About Corona?

Corona can be eliminated: Tests of many different designs and insulations over long periods under extreme voltage conditions prove it. Lessons learned from these tests have been applied at the thousands of points in a transformer where corona may develop. This is the first step in elimination of this damaging phenomenon. Proper dimensions, modifications in shapes, and careful application of latest insulation techniques are needed.

Allis-Chalmers applies these principles to all its power transformers. As a result, from the design standpoint, they merit the reassuring designation "corona-free."

But Allis-Chalmers does not stop with design. In addition, each transformer is thoroughly tested before shipment to provide a final check. When you buy an Allis-Chalmers power transformer you get a transformer that stays young because there is no corona that can cause damage.

How Corona Cuts Transformer Life



Corona is the cause of unexpected failure. It is a condition created by slight weaknesses in insulation or design. Its effects are cumulative. Although at the beginning corona is hard to detect, eventually it will develop into arcing and failure.

Using a simple dielectric structure, the diagrams show how corona develops and how it can be eliminated. Flux lines in the upper diagram illustrate how concentration at sharp corners of a conductor tend to cause very high stress at these points. If the stress is high enough, corona can develop and grow to the point where flashover must occur.

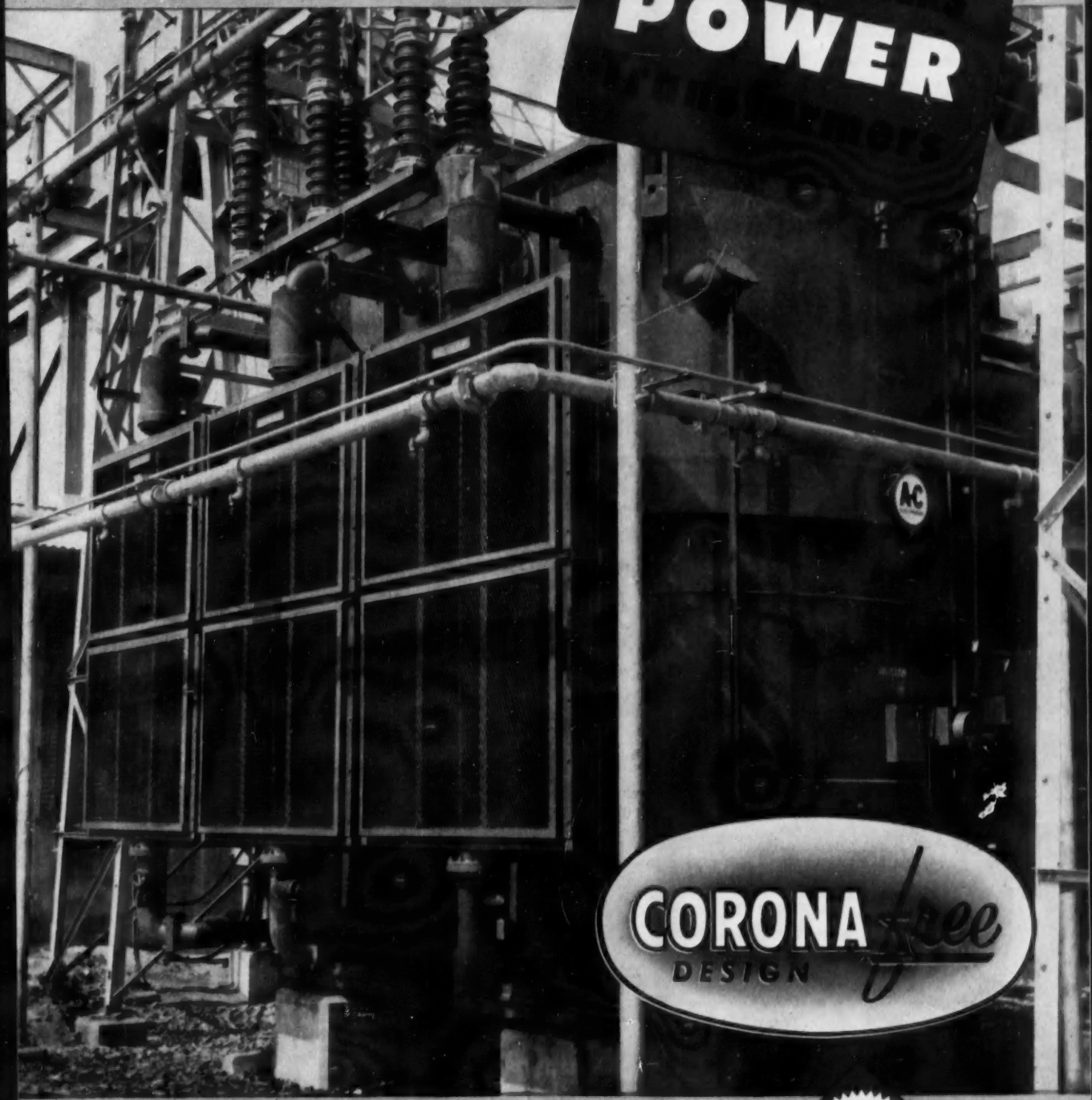
The lower diagram shows how to eliminate corona. Use of proper dimensions, correct insulation thicknesses, and modified shapes permits development of a structure in which corona cannot develop even under breakdown voltages.

Each of the thousands of points in a transformer where corona may occur is designed and tested to eliminate this possibility. Thus, Allis-Chalmers transformers earn their designation, "Corona-Free."

A-4438

ALLIS-

This 125,000-kva Allis-Chalmers power transformer operates at the Far Rockaway Station of the Long Island Lighting Company. It was built to operate at 76 db, 9 db under standard sound levels. It is a forced-oil-air unit with an air-to-oil radiator type heat exchanger.



CHALMERS

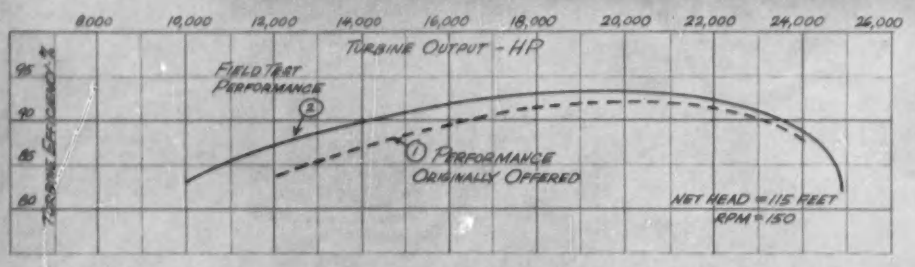
A-C ALLIS-CHALMERS

MILWAUKEE 1, WISCONSIN

Two SMS-Francis turbines at Tenkiller Ferry Dam on the Illinois River in Oklahoma are rated at 23,000 hp each under 132 feet net head.

SMS
FRANCIS TURBINES

Photo—Aerial Photo Service, Tulsa, Oklahoma.



FIELD TESTS EXCEED PROPOSED PERFORMANCE AT TENKILLER FERRY DAM

Existing designs at the time of the proposal enabled SMS to offer the performance shown on Curve 1 (above) for the Tenkiller turbines which are of only medium size. Subsequent homologous model tests required by the Corps of Engineers led to improvements which were incorporated in the final design. These resulted in the performance shown by Curve 2, plotted from actual field tests made at 115 feet net head. Actual efficiency exceeded the initially proposed performance at all loads.

This illustrates that the outstanding performance of SMS products results from laboratory research as well as from specialized engineering and production. For information on SMS turbines and related hydraulic equipment, write to the S. Morgan Smith Company, York, Pennsylvania.

Hydraulic Turbines
Pumps
Gates & Hoists
Trash Rakes
Accessories

HYDRODYNAMICS

Rotovalves
Ball Valves
Butterfly Valves
Free-Discharge Valves
Controllable-Pitch Ship Propellers

S. MORGAN SMITH CO.

AFFILIATE COMPANY: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

Give the Guy a CHANCE

the NEVER-CREEP pulls against undisturbed earth in machine or hand-bored holes

Circle shows reinforcing plate and rod socket.
The Never-Creep is formed of high strength structural steel, reinforced in area of greatest pull with a high carbon steel core plate.
they've been trying to pull this one out since great grandpappy's days!
MIKE THE MOLE ©

Once in, they're in to stay!

Pull test after pull test—made for power companies all over the country—show the same result: "Test stopped without failure. There was no damage to the anchor."

And the test of time proves that thousands of Never-Creeps installed for years and years hold more "over the long pull" than any other type of anchor.

Chance Never-Creep Anchors can be installed in holes drilled at an angle by your hole boring equipment. The size of the hole makes no difference in the holding power of the Never-Creep—it pulls entirely against solid undisturbed earth, and is practically unaffected by moisture seepage.

Protect your investment in line construction by specifying Chance Anchors for your guys. The Chance Distributor in your area can probably fill your order from stock. *Specify Chance for Service!*

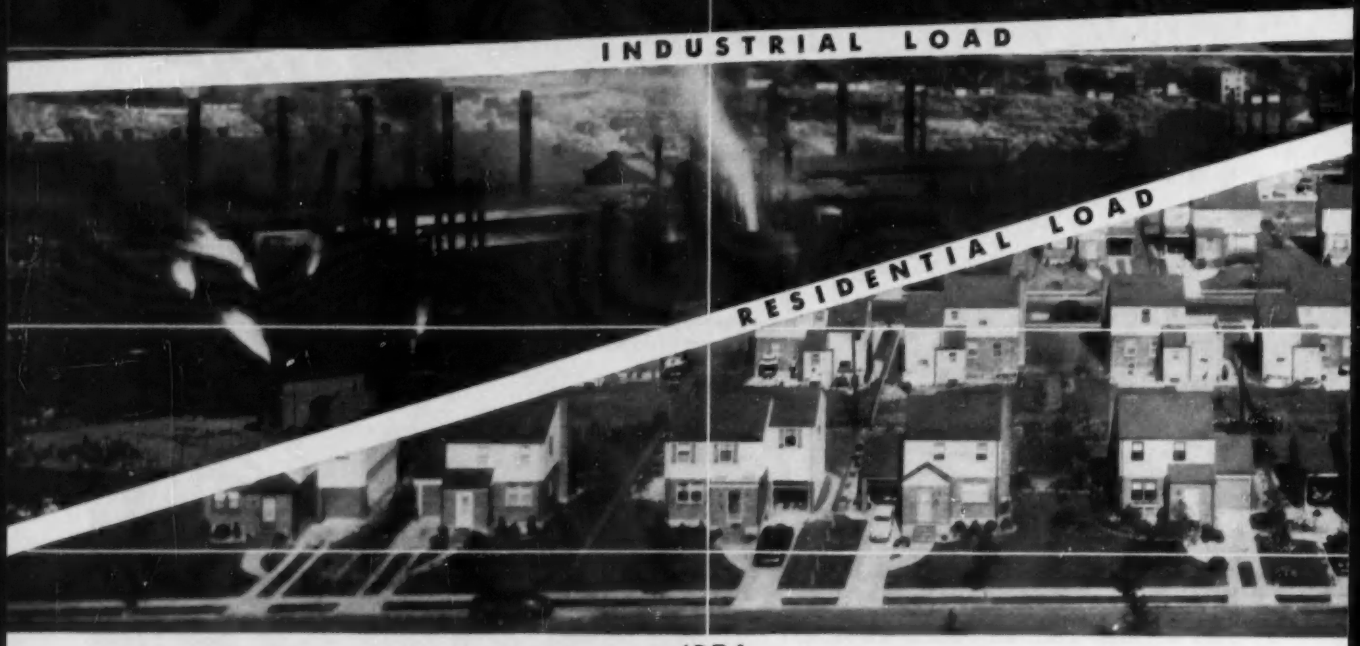
ABC INDUSTRIES

A·B·CHANCE CO·

CENTRALIA, MISSOURI
SAN FRANCISCO, CALIFORNIA

ANCHORS • GUYING FIXTURES • LINE CONSTRUCTION TOOLS • CONDUCTOR CLAMPS
GROUNDING EQUIPMENT • HOT LINE TOOLS • HIGH VOLTAGE SWITCHES • CUTOUTS

Residential Load Will Equal Industrial Load



1954

Here's the most economical way

Use G-E Unit Substations to reduce system investment

Add capacity to handle your steadily growing residential market and do it the most economical way with G-E Unit Substations.

No excess investment is needed because you buy no more capacity than is actually required. That means economy today—plus quick and easy expansion to meet the demands of tomorrow.

G-E Unit Substations can simplify the problems of expansion as requirements increase. Advance planning and proper substation selection, for example, permit you to expand a radial system into a network system.

Have capacity available when you need it by ordering G-E Unit Substations in advance on the basis of predicted load growth. Then, when your load grows, select sites where capacity is needed and your substations are ready to be installed.

"How to Reduce System Investment" (Bulletin GEA-5847) will help you plan for economical system expansion. It discusses system planning and reveals how other utilities are handling rapidly growing loads. For your copy, write General Electric Company, Section 512-3, Schenectady 5, N. Y.

Progress Is Our Most Important Product

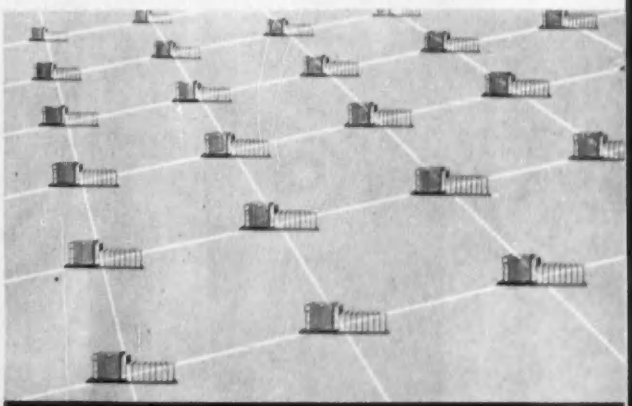
GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

RESIDENTIAL LOAD IS GROWING rapidly, and is expected to equal industrial load by 1973. Utilities can meet their residential distribution demands yet trim system investment by advance planning with G-E Unit Substations.

to grow with your residential load

LOCATIONS FOR UNIT SUBSTATIONS are "on the mile every mile" to economically serve residential areas. By properly locating small unit substations for expansion into such a system, utilities can economically grow with increasing demands and provide residential customers with economical power and maximum service continuity.



EVERY MILE ON THE MILE

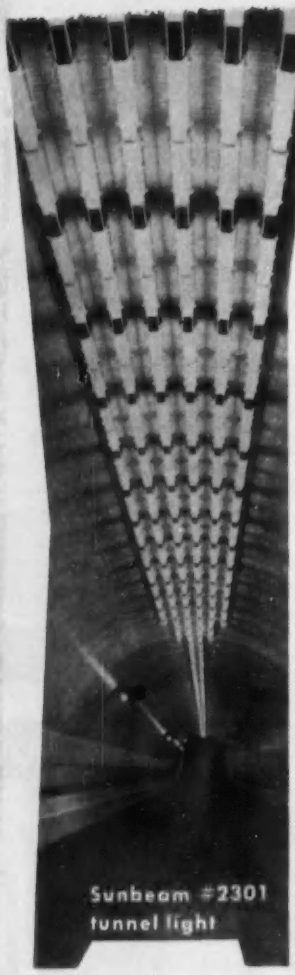
POPULATION GROWTH in the U.S. since 1947 has been 11%—population in the suburbs has grown 43%. Since 1941 the average kilowatt-hours use per residential customer has doubled every 10 years and is expected to double again in the next decade. This fast-growing suburban growth trend has been going on for a long time—is expected to last indefinitely.

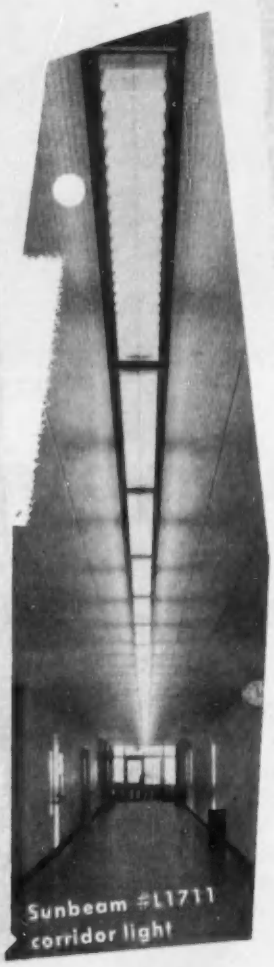
HOW THE SUBURBANITES MULTIPLY

it narrows down

to Sunbeam lighting every time

- TUNNELS
- CORRIDORS
- LIBRARY STACKS
- STOCK BINS





Daylight seldom reaches such narrow, confined locations as listed above. Only thoroughly engineered light fixtures — **Sunbeam Visionaires®**—will provide the scientific illumination which these areas require. Sunbeam Lighting is nationally recognized for the development of the most advanced and practical luminaires for tunnels. Other important units are corridor and stack lights designed to project the major portion of the light output outward to walls and stacks. A more uniform vertical distribution of light is achieved resulting in easier seeing and more efficient working environment. For engineered lighting, narrow your specification to Sunbeam lighting.

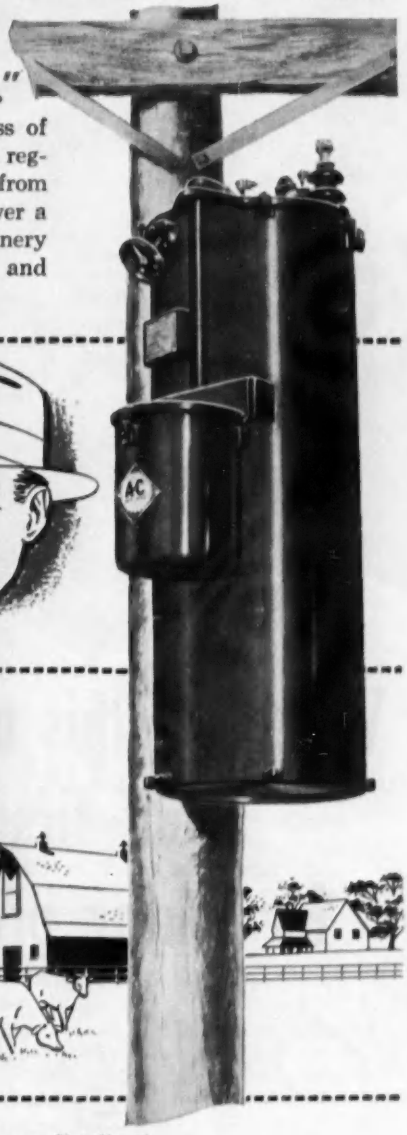
SUNBEAM LIGHTING COMPANY, 777 EAST 14TH PLACE, LOS ANGELES 21, CALIFORNIA

Here's What System Operators Say About

Allis-Chalmers DISTRIBUTION REGULATORS...

"We increased revenue — and profits."

Because they maintain correct voltage regardless of cause of voltage drop, Allis-Chalmers distribution regulators assure system operators maximum profits from increased loads. Their narrow ± 1 volt band over a 20% range means that new appliances and machinery provide maximum service to the consumer — and maximum profits to the system.

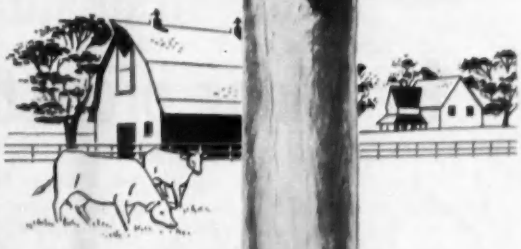


"We eliminated voltage complaints."

Adding load may actually mean adding maintenance crews and equipment unless you assure proper voltage levels. Allis-Chalmers distribution regulators provide an exceptionally flexible solution to voltage problems — they can be used again and again — even after feeders have been rebuilt — because they are so easy and so economical to reinstall.

"We get practically trouble-free service."

Ten years of operating experience has proved the economy and reliability of Allis-Chalmers distribution regulators. The first installation was on a Wisconsin rural system. Field operation has borne out the results of laboratory tests which showed that these rugged units can withstand millions of operations, equivalent to decades of service with little or no maintenance.



● Get all the facts on how Allis-Chalmers distribution regulators can increase revenue and profits, can improve customer satisfaction, and can eliminate problems caused by incorrect voltage. Call your nearest Allis-Chalmers district office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

AC ALLIS-CHALMERS

ALLIS-CHALMERS

AC4519

Write for this new folder about first aid for wiring protection

Youngstown

BUCKEYE QUALITY YOUNGSTOWN SERVICE **CONDUIT**

●Youngstown Buckeye Conduit is full-weight rigid steel and is manufactured as Hot Galvanized, Electro-Galvanized and Black Enameled. It is available for immediate delivery in sizes from half inch up to six inches. We can also furnish Electrical Metallic Tubing in sizes from half inch up to two inches.

"4 Ways to Greater Efficiency, Lower Installation Costs" is a new folder giving a full description of each type, with complete information as to wall thicknesses, fittings, etc. Copies are available at no charge to guide you and your customers in the selection of steel conduit. Write for as many as you can use.

Rigid steel conduit is the SAFE raceway approved by the National Electrical Code for all hazardous locations. To be ENTIRELY SAFE use the best, use Youngstown Buckeye Conduit, your first aid for wiring protection.

THE YOUNGSTOWN SHEET AND TUBE COMPANY Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

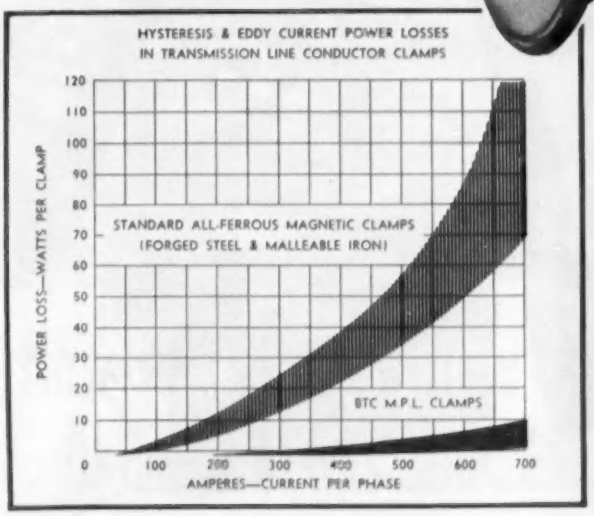
SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

Minimum Power Loss

One of the basic advantages you get with

BTC

Drop Forged M.P.L. ALUMINUM Suspension Clamps



IT'S A FACT...

The use of a non-magnetic Aluminum Clamp Body reduces eddy current and hysteresis losses to a minimum. At the same time, it prevents temperature rise in clamped section of the conductor, which will operate at lower temperature than in the span.

THIS IS JUST ONE of many reasons why it pays to use BTC drop forged M.P.L. Aluminum Suspension Clamps on your transmission lines. Specify these performance-proved BTC Clamps the next time you order from your insulator manufacturer!

Sold Through Your Insulator Manufacturer Only.

Drop Forged BTC *Hi-Line Hardware*

The BREWER-TITCHENER Corporation

Cortland · New York

Nicopress

The Tool and the Sleeve

that are made to work together

together they make the perfect splice

Nicopress Sleeves and Tools Patented in U. S. and Foreign Countries. "Nicopress" Registered in U. S. and Foreign Countries.

The National Telephone Supply Company

5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO

Canadian Mfr.—N. SLATER CO., LTD., HAMILTON, ONT., CANADA

Export Distributor—INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

THE NATIONAL TELEPHONE SUPPLY COMPANY

PROJECT SERVICES REPORT

ARBUCKLE STATION, first outdoor station on the O G & E system, is furnished completely with General Electric equipment. Third largest on the system, this station adds 70,000 kw to meet growing load in southern Oklahoma.

New all G-E Arbuckle station boosts capacity of Oklahoma Gas and Electric system over 20%

Sharply increased residential and commercial loads throughout southern Oklahoma created the demand for the newest station of Oklahoma Gas & Electric Company. The third largest station in the O G & E system, this new installation alone adds over 20% to system capacity.

Arbuckle Station is an outstanding example of a modern outdoor plant whose single-boiler turbine-generator supplies 70,000 kw to the system. All electrical equipment, including the turbine-generator for the station, was furnished by General Electric Company with a project team assigned to co-ordinate equipment design, manufacture, and installation with the electric utility and its consultants, Sargent and Lundy.

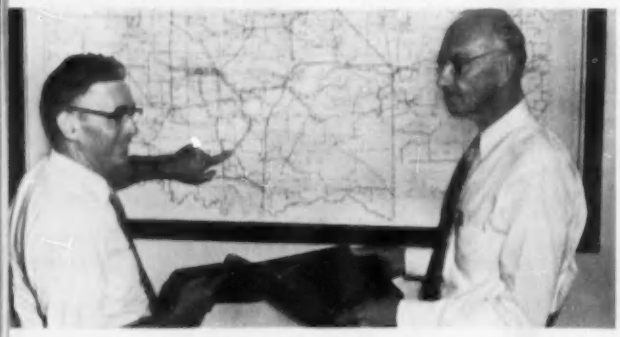
GENERAL ELECTRIC

For further details, see next page ▶

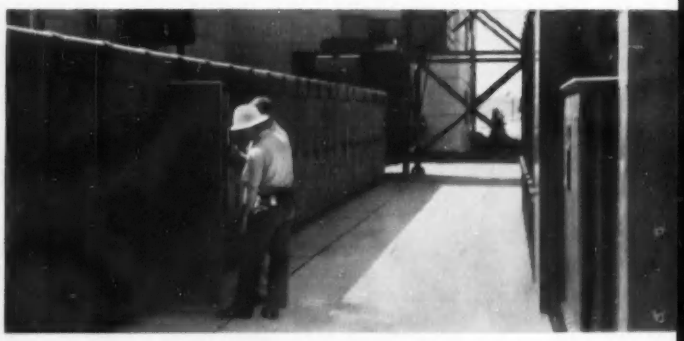
PROJECT SERVICES REPORT

70,000 KW TURBINE-GENERATOR is largest on O G & E system. Governing mechanism, exciter are encased in weatherproof housings for reliable outdoor operation. Turbine is tandem compound double-flow, with steam conditions of 850 psig, 900 F. Design of station auxiliaries, such as Metal-Clad switchgear and station transformer, permits outdoor placement.

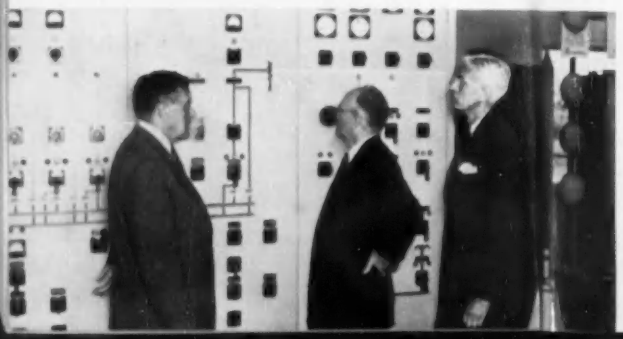
Oklahoma G&E, Sargent & Lundy select G-E



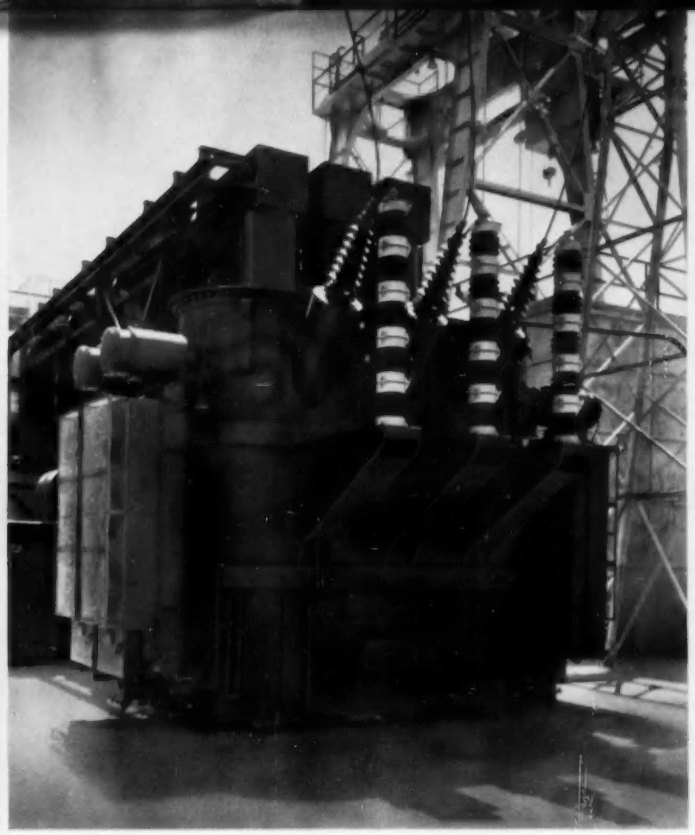
EARLY PLANNING of Arbuckle Station found J. W. Blake (left), Superintendent of Generation for O G & E, discussing plant location and basic one-line electrical diagram with G.E.'s Ralph Randall of Oklahoma City. Such preparation permits early allocation of manufacturing space and faster shipment.



OUTDOOR SWITCHGEAR is of weatherproof Metal-Clad construction. This equipment, located immediately below the G-E isolated phase bus and station auxiliary transformer connections, provides the ultimate in protection with its revolutionary Self-X flame retardent insulation.

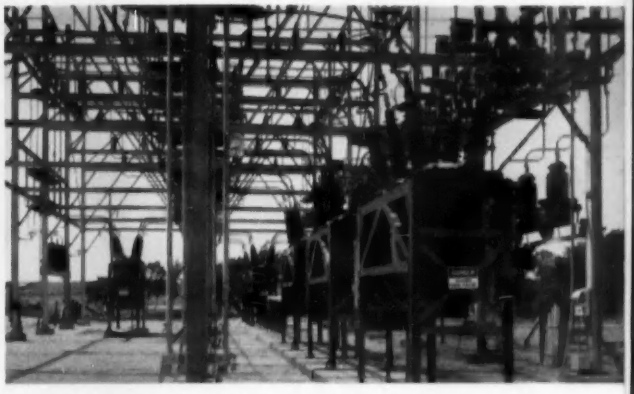


"ON-THE-LINE" DATE brought (left to right) L. Skog, President of Sargent and Lundy; W. B. Gesell, Vice-President—Operations for O G & E; and C. H. Linder, Vice-President—Engineering of G.E., to the G-E master control board which coordinates efficient operation of this 100% G-E equipped station.



MAIN POWER TRANSFORMER, rated 82,500 kva, 69 kv, is forced-oil-air cooled. Shipping all assembled except bushings and accessories brought savings in cost, installation time.

REGULAR G-E PROJECT REPORT is studied here by O G & E's R. F. Danner (left), Mgr.-Engrg. and Construction; Otis Howard, Mgr.-Operations; and W. B. Gesell, Vice-President.



HIGH-VOLTAGE SWITCHYARD uses 69 kv oil circuit breakers. Design, manufacture, and delivery of all switchyard equipment, including steel structure and electrical cable, is handled as a unit.

equipment, benefit from unit responsibility

Oklahoma Gas & Electric's new 70,000 kw Arbuckle Station demonstrates the important economies of unified equipment selection and installation. Sales and engineering specialists of General Electric, working as a project team, assisted the utility and its consultant in fully integrating equipment design, manufacture, and delivery, helping keep the installation on schedule. Such teamwork not only makes it possible to meet the required service date but also saves money in installation.

General Electric's vast facilities for producing electrical equipment for the Arbuckle Station were marshalled by the project team. The local sales engineer, product specialists, and utility application engineers assisted with proper selection, design, and electrical co-ordination. Scheduling co-ordinators issued regular consolidated equipment status reports. On the site, field and installation engineers followed through to assure correct installation and operation.

Project Services teamwork on installations involving major electrical components can help electric utilities and their consultants save time and money and conserve engineering manhours. For example:

SIMPLIFY ORDERING OF EQUIPMENT, purchased either directly, or through your consulting engineers, or through a machinery manufacturer.

CONSERVE ENGINEERING TIME by handling electrical details which frees you and your consulting engineers for other urgent problems.

INTEGRATE EQUIPMENT DESIGN to assure the maximum flexibility and effectiveness of plant operation.

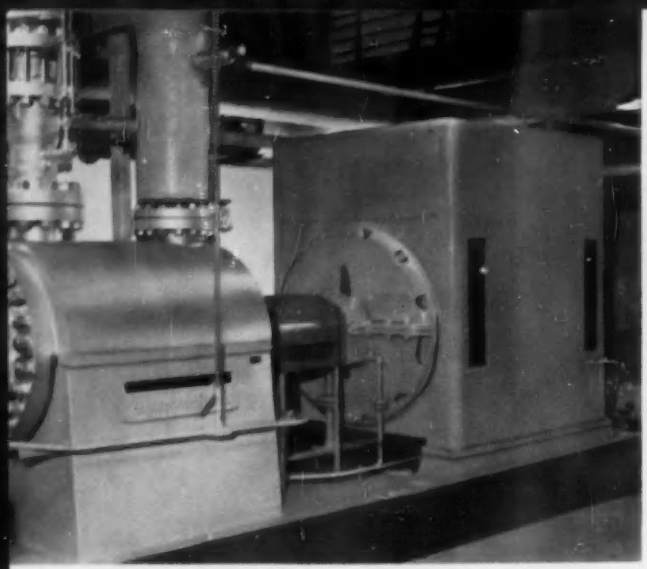
SPEED CONSTRUCTION by scheduling the arrival of equipment for maximum installation efficiency.

ASSIST IN INSTALLATION AND IN TRAINING OPERATORS to assure minimum start-up time and better understanding of the full operating capabilities of the equipment.

For details contact your General Electric Apparatus Sales Office, or write Section 302-2, General Electric Co., Schenectady 5, N. Y.

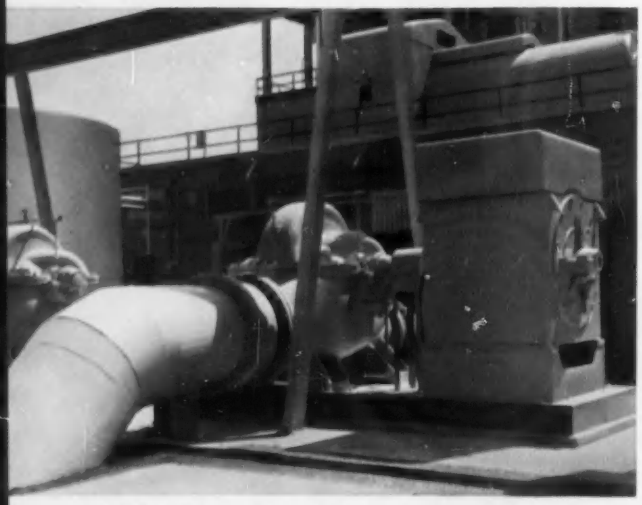
GENERAL ELECTRIC

See next page for more data on project services



BOILER FEED PUMP MOTORS, rated 1750 hp, have overhead vent (far side of motor above) to keep exhaust from personnel and adjacent motor intakes.

RELIABLE POWER SUPPLY for eight cooling tower fan motors, outdoor load-center unit substation is double-ended, equipped with advanced-design drawout switchgear.



WEATHER PROTECTED MOTORS supply 700 hp each to circulating water pumps. This construction permits outdoor installation without further protection.

TOTALLY ENCLOSED CONSTRUCTION protects cooling tower fan motors from spray, dirt. Details, such as control in main plant, are followed by G.E. team.

Auxiliary motors and controls, from boiler feed pumps to cooling tower fans, supplied by G.E. for first all-outdoor station of Oklahoma G & E

All electric motors and controls for the new Arbuckle Station were specifically engineered by General Electric for power station application. Through the project team's efforts, selection, ordering, and installation of these motors were all greatly simplified.

Field-proven motors, available in all sizes and types from G.E. for every operating need, meet power plant requirements, in several designs and enclosures.

For details on Project Service, contact your G-E Apparatus Sales Office, or write for GEA-6302 to Apparatus Sales Division, General Electric Co., Schenectady 5, N. Y. 302-2

More Power to America

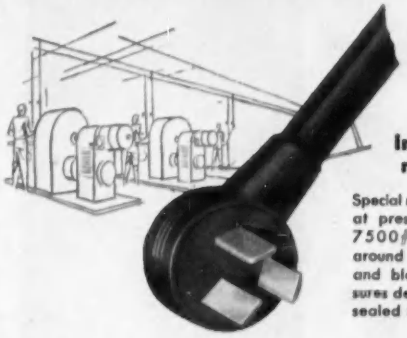
GENERAL ELECTRIC

THERE IS A "RIGHT" CORD

For Ranges and Dryers

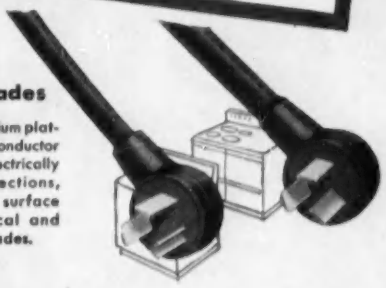
It's a **PARANITE®** "SAFE" cord

and here's why



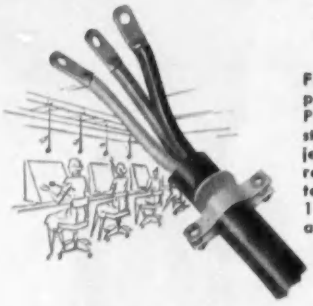
injection molded

Special rubber compound, at pressures exceeding 7500# p.s.i. forced around jacket, insulation and blade junctions insures dense permanently sealed rubber cap.



plated blades

Complete Cadmium plating, from tip to conductor crimp, assures electrically superior connections, better contact surface within receptical and clean bright blades.

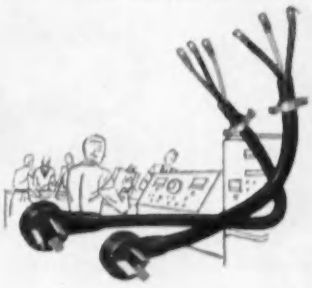


100% "cords" control

From rubber, compounded specially at the Paranite Mill, through stranding, insulating, injection molding, strain-reliefs, terminals, and tests, these cords are 100% inspected and UL approved.

electrically superior

Insulation Resistance between conductors exceeds 32,500 meg-ohms. (50 meg-ohms standard). Dense molded cap insures exceedingly high dielectric strength properties.



It takes specially compounded rubber, precisely controlled equipment and close supervision to injection mold these 90° angle caps . . . but look at the results! You get a firm, dense and more uniform permanently molded cap that means complete customer satisfaction.

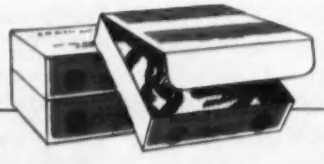
Cadmium plating of blades is another important "extra" you get with all PARANITE Range, Dryer and Appliance Cords . . . which assures a more dependable and surer electrical contact.

PARANITE Cords give outstanding performance . . . Insulation Resistance of over 32,500 meg-ohms and extremely high dielectric qualities prove their superiority.

To perfect, manufacture and 100%-inspect cords of this calibre takes extra effort . . . but PARANITE "Safe" Cords have a reputation to maintain and *they must be* RIGHT!

RANGE CORDS	DRYER CORDS
RP-1 2 #8—1 #10	RP-10-PG 3 #10
RP-2 2 #6—1 #8	
RP-3 3 #6	

separately packed in sturdy cartons



If it's PARANITE it's right

PARANITE WIRE & CABLE DIVISION • ESSEX WIRE CORPORATION

FORT WAYNE 6, INDIANA

MANUFACTURING PLANTS: Birmingham, Alabama; Anaheim, California; Jonesboro, Indiana; Marion, Indiana.

WAREHOUSES* AND SALES OFFICES

* Atlanta, Georgia, 241 Boulevard, N. E.
Boston, Mass., 1040 Tremont Street
* Chicago, Illinois, 411 South Peoria Street
Cleveland, Ohio, 1900 Euclid Avenue
Dallas, Texas, 1917 Levee St.
* Detroit, Michigan, 634 Seldon Avenue
Hartford, Connecticut, 119 Ann Street
Indianapolis, Indiana, 5219 Crittenden Avenue
* Kansas City, Missouri, 2000 Forest Avenue
* Los Angeles, California, 2240 East Washington Blvd.
Minneapolis, Minnesota, 5407 Excelsior Boulevard
* Newark, New Jersey, 457 Frelinghuysen Avenue
Omaha, Nebraska, 320 W. O. W. Building
* Portland, Oregon, 525 North Tillamook St.
Upper Darby (Philadelphia) Pa., 6816 Market Street
Rochester, New York, 207 Powers Building
* San Diego, California, 1305 Harbor Drive
* Saint Louis, Missouri, 3435 Chouteau Ave.
* San Francisco, California, 1077 Howard Street
Springfield, Illinois, 104 South 6th Street

CONVENTIONAL 7-CONDUCTOR #8 AWG IN 1¼" CONDUIT.

ALMOST DOUBLES YOUR CONDUIT CAPACITY

PNR 12-CONDUCTOR #8 AWG IN 1¼" CONDUIT.

ROCKBESTOS PNR

SMALL DIAMETER CONTROL CABLE

Here's a smaller, lighter control cable that saves you labor, conduit, fittings. Approximately ½ the size of conventional control cable, Rockbestos PNR lets you pull 12 conductors where before you had only 7.

Millions of feet are now in service. Get the full PNR story. Find out where it can save you time and money. Write today, or call in your nearest Rockbestos representative.

PROPERTIES OF PNR

46% smaller in area . . . 28% smaller in diameter than conventional control cable. Use smaller conduit and fittings or put more conductors in existing conduit.

Lighter, easier to handle, store, ship, pull through conduit.

Dielectric breakdown . . . over 40 times operating voltage.

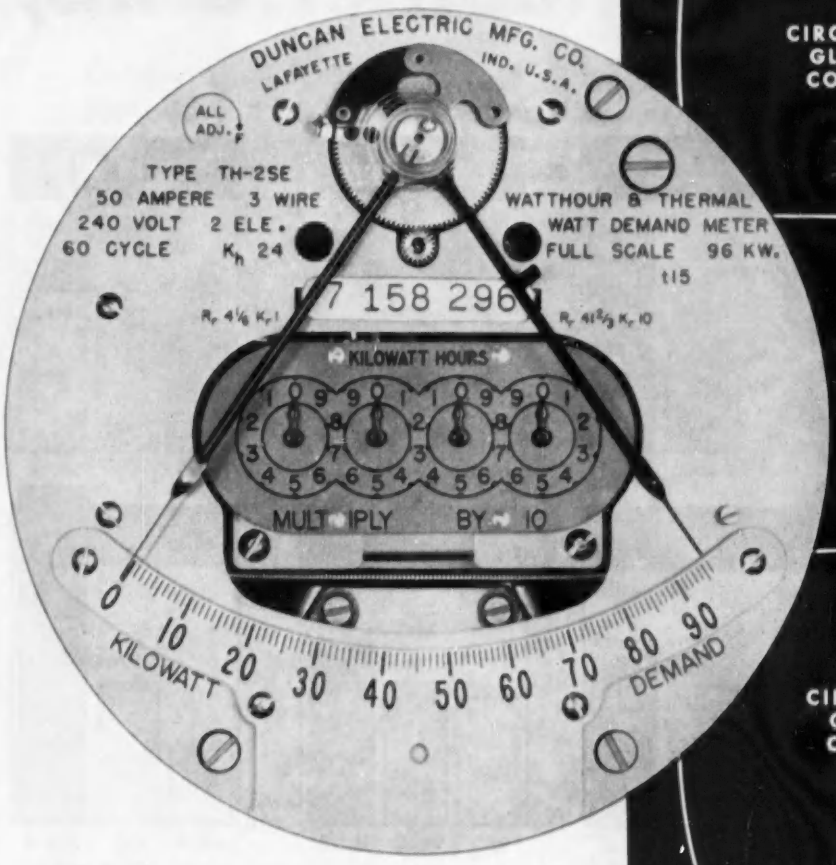
Rated 600 volts . . . conductor operating temperature 168°F.

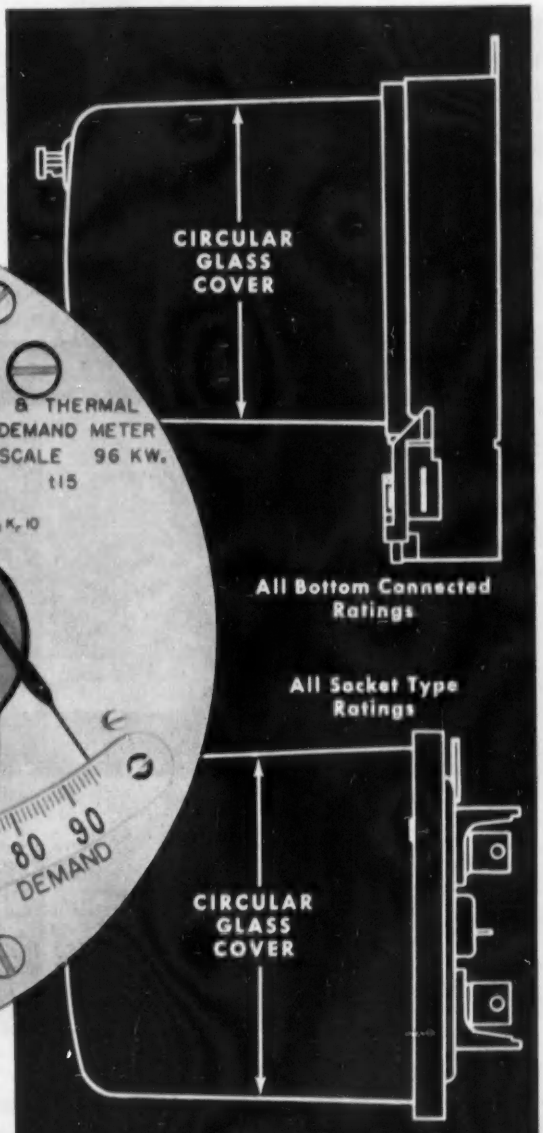
Flexible from 168° to —67°F. No cracking!

ROCKBESTOS PRODUCTS CORPORATION
NEW HAVEN 4, CONN.

NEW YORK • CLEVELAND • DETROIT
CHICAGO • PITTSBURGH • ST. LOUIS
LOS ANGELES • NEW ORLEANS
OAKLAND, CALIFORNIA • SEATTLE

COMPACT DESIGN!





1. Complete Polyphase Combination Thermal in standard circular glass covers — saves space.

2. Available in all types and ratings — 3- or 4-wire.

3. Built in "extended range" ratings — self-contained capacity to 200 Amps.

4. All calibrating adjustments accessible from front.

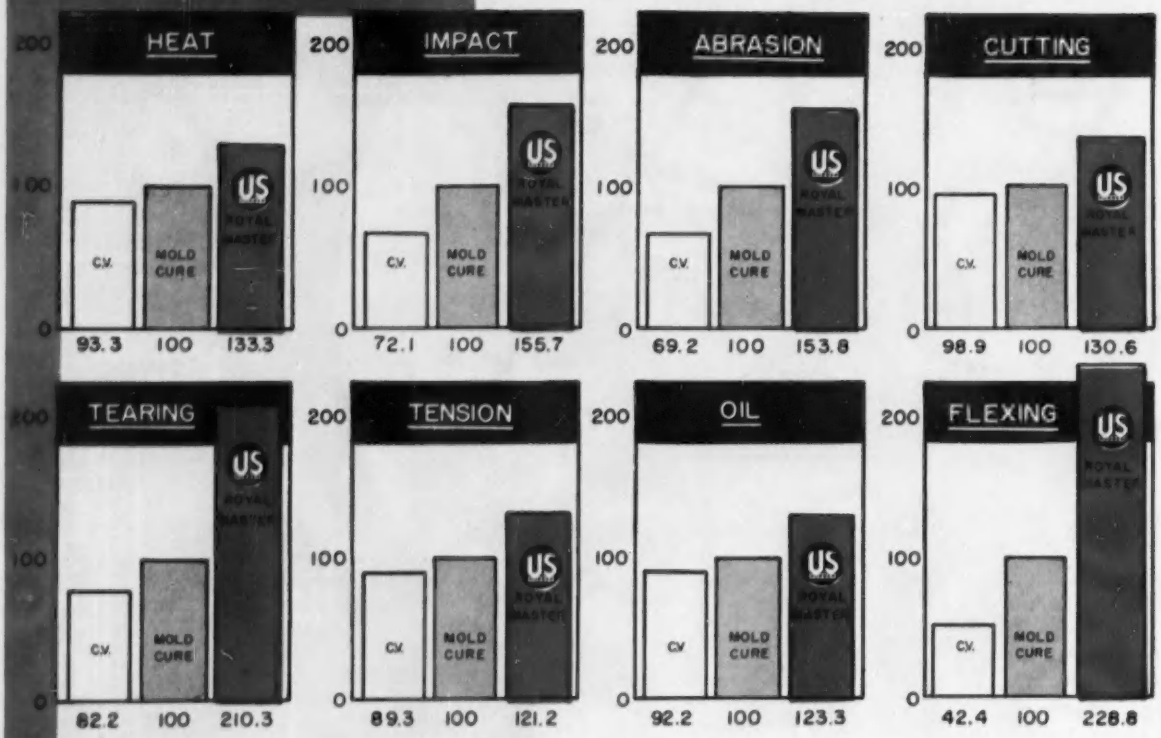
DUNCAN ELECTRIC MFG. CO.
LAFAYETTE INDIANA

Pioneers in Extended Range Metering

DUNCAN

POLYPHASE COMBINATION THERMAL DEMAND METERS

New U.S. ROYAL outperforms,



Comparative performance of portable cords related to major life factors.

Graphs illustrate the outstanding superiority of new U. S. Royal Master Cord—over the average of molded cords and the average of short-lived continuous vulcanized cords of other makes—on every major life factor. (Average of other molded cords is rated at 100%.)

US RUBBER

UNITED STATES

ELECTRICAL WIRE AND CABLE DEPARTMENT

MASTER portable cord *outlasts all others!*

Comparative tests show U. S. Royal Master gives $1.88 in value for every $1.00 spent—almost *twice* the service value of the average of other molded cords!

LOOK FOR THE NAME—U. S. ROYAL MASTER

Two years ago, "U. S." engineers began a *complete reexamination* of portable cord construction, service life, and the causes of cord failure.

Over 10,000 tests were made. More than a thousand cords of all leading makes, including our own famous U. S. Royal Cord, were analyzed, tested, and compared.

Every life factor was considered and carefully evaluated, alone and in its relation to overall cord performance and service life.

Backed by 64 years of experience in the manufacture of electrical wire and cable, U. S. Rubber engineers then translated their findings into an entirely new portable cord, designed to surpass any other previously made.

Extensive tests, both in the laboratory and in outside plant installations have proved this new portable cord startlingly superior in every respect!

New U. S. Royal Master is unquestionably the finest cord you can buy!

From every standpoint, as the charts at left illustrate, new U. S. Royal Master is a finer, more durable cord—actually gives 88% longer life than the average of competitive molded cords—far longer than *any* other cord—surpassing even a hypothetical cord incorporating the best features of all those tested!

Far greater value, too! In spite of almost doubled service life, this great new cord is in the same price category as other molded cords—giving you $1.88 in cord value for every cord $1.00!

Prove to yourself the outstanding superiority of new U. S. Royal Master Portable Cord—in both service life *and* economy! Get in touch with your "U. S." distributor today!

Approved by Underwriters' Laboratories, Inc.

RUBBER COMPANY

ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Can't rust out!

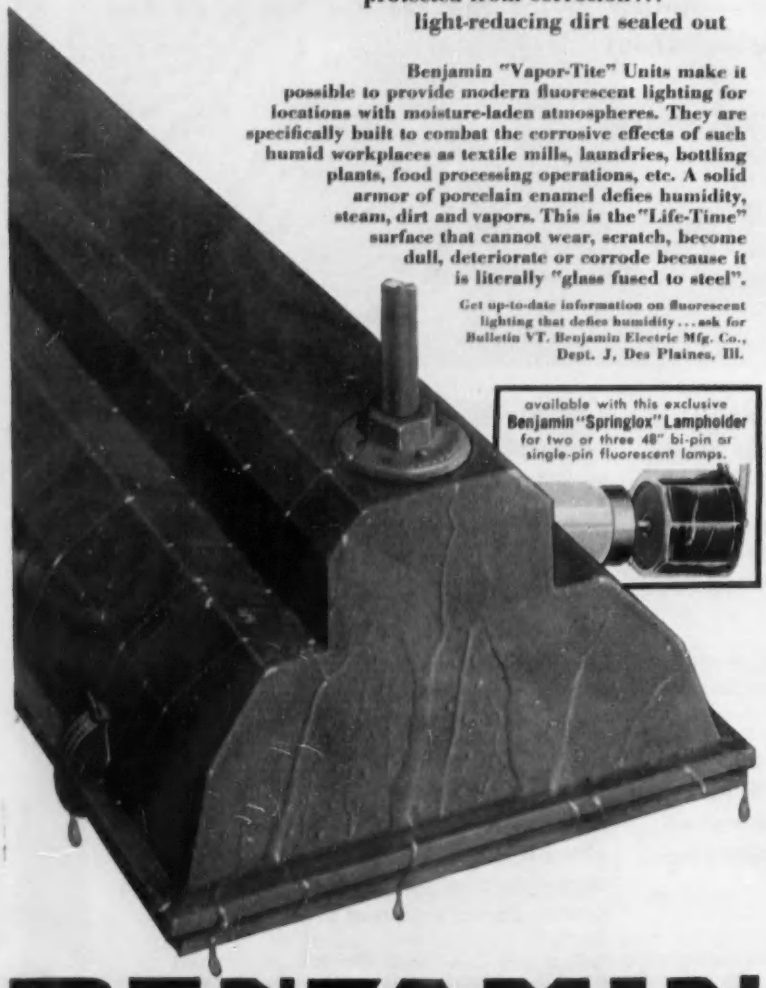
no cracks or crevices... no place for rust to get a foothold... seamless, one-piece housing with unbroken surface of "Life-Time" Porcelain Enamel!

No service breaks due to humidity!

poor lamp-starting eliminated... electric contacts protected from corrosion... light-reducing dirt sealed out

Benjamin "Vapor-Tite" Units make it possible to provide modern fluorescent lighting for locations with moisture-laden atmospheres. They are specifically built to combat the corrosive effects of such humid workplaces as textile mills, laundries, bottling plants, food processing operations, etc. A solid armor of porcelain enamel defies humidity, steam, dirt and vapors. This is the "Life-Time" surface that cannot wear, scratch, become dull, deteriorate or corrode because it is literally "glass fused to steel".

Get up-to-date information on fluorescent lighting that defies humidity... ask for Bulletin VT. Benjamin Electric Mfg. Co., Dept. J, Des Plaines, Ill.


available with this exclusive
Benjamin "Springlox" Lampholder
for two or three 48" bi-pin or
single-pin fluorescent lamps.

BENJAMIN TRADE MARK

682

"VAPOR-TITE"

Sold exclusively through electrical distributors

A Product of Benjamin Electric Mfg. Co.

makers of famous Benjamin and Leader Line lighting equipment and Sound Signals for Industry, Institutions and Commerce.

LETTERS TO THE EDITOR

Protests Interpretation

To the Editor:

In your December issue in the Contractors' News Letter you make some statements concerning the powers of the board of governors of the NECA which I feel should be corrected since they are entirely assumptions and not based on fact.

The board of governors has no powers, nor has the NECA any powers at the national level to negotiate with the IBEW to conclude any agreements covering wages, hours or any other working conditions between contractors and labor. Where the local chapter has been recognized as the bargaining agent it can carry on through its members locally the negotiations with the locals of the unions involved but in no case is the national recognized as the bargaining agent.

Of course it might be argued that influence from the national headquarters of both the NECA and the IBEW might tend to influence local bargaining but the fact remains that any agreements reached between contractors and labor must be reached at the local level, and neither side is required to accept any recommendations the national headquarters of each side may suggest. A better understanding of this fact should be reached by everyone to avoid misunderstandings and to prevent undue influence being felt in local bargaining meetings, something which may have existed in some past instances.

I recognize the danger implied in the referred to comments, but I do not agree with the premise and do not think the comment should go unanswered. Maybe that is your reason for printing it. If so I hope it gets the desired results.

A. Woolley
Governor
Utah-Idaho Chapter, NECA

For the road ahead we merely set up a caution sign based on past experiences with the pension program and IBEW President Milne's declared aims for future goals. The signs simply read, "Watch for curves." It is the governors now who bear the responsibility for safe driving.

—*The Editors*

Trick of Trade

To the Editor:

I think this "trick of the trade" would prove as profitable to a shop on the West Coast as it no doubt is proving here in the Southwest.

Driving behind a truck the other day I read, printed in large letters on the rear doors, the words, *If You Can't Find Your Shorts, Call Us.* Curious to know what it was all about, I hurried to pass the truck to see if I would be enlightened by a further message on the sides. I was as I read, *Electrical Repair Equipment Shop.*

F. A. McKinney
Albuquerque, N. M.

SAVE

$64.25 PER 1000 FEET

with Kaiser Aluminum Triplex

As YOU SEE in the box below, when you switch from three open wire copper services to Kaiser Aluminum Triplex you save up to $64.25 per 1000 feet—based on reports from 10 utilities.*

You can be sure of getting the *maximum* savings from Kaiser Aluminum Triplex by taking full advantage of Kaiser Aluminum service. Experienced Kaiser Aluminum field engineers work with your crews right in the field where desired, demonstrate ways to speed installations and cut costs.

ACT NOW—as hundreds of power companies are doing! Convert to Kaiser Aluminum conductor easily, efficiently, economically—and save thousands of dollars a year. Contact any Kaiser Aluminum sales office listed in your telephone directory, or one of our many distributors. Kaiser Aluminum & Chemical Sales, Inc. General Sales Office, Palmolive Bldg., Chicago 11, Ill.; Executive Office, Kaiser Bldg., Oakland 12, Calif.

Kaiser Aluminum

The nation's largest producer of triplex and aluminum weatherproof conductor

Here is a typical example of the big savings possible with Kaiser Aluminum Triplex

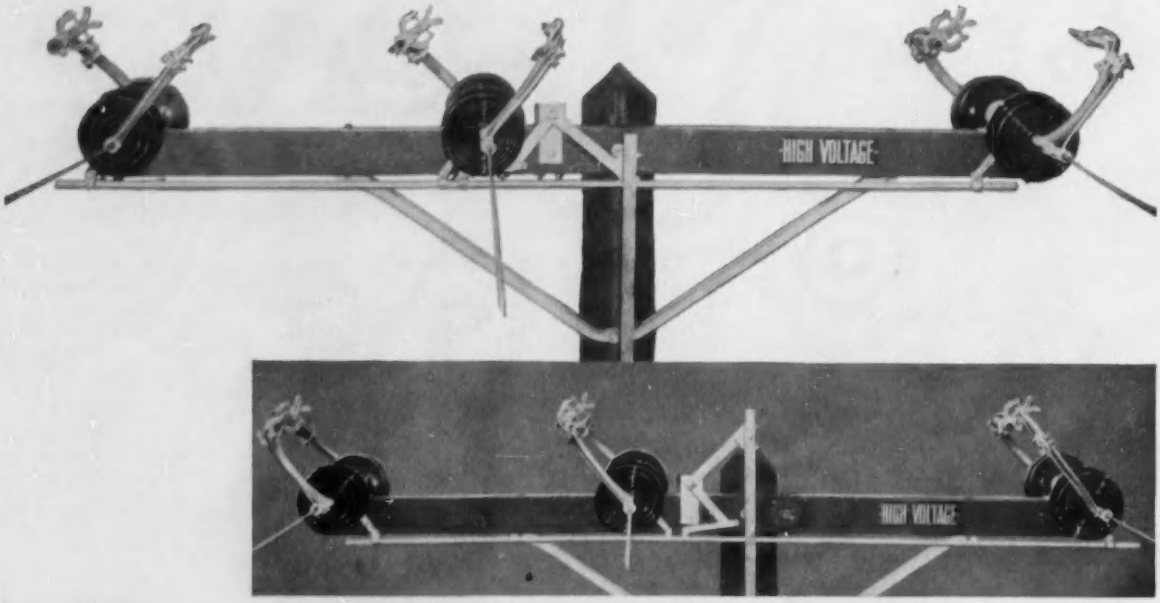
INSTALLED COSTS FOR 10 SERVICE DROPS (Average Length of 100 ft.)

	#6 Solid TBWP Copper	#4 Kaiser Aluminum Triplex (Oyster)
Cost of conductor	$135.15	$103.00
Cost of pole taps, entrance connectors, house wireholders	15.30	14.70
Total materials cost	$150.45	$117.70
Total labor cost	80.80*	49.30*
TOTAL COST	$231.25	$167.00

TOTAL SAVING—$64.25—PER 1000 FT.!

*Average labor costs based on reports from 10 utilities in various sections of the country that have switched from three open wire type service to Kaiser Aluminum Triplex.

If you have a question on accessories, your local Kaiser Aluminum conductor engineer will be glad to advise you. Call him now.



Note clean, neat pole top appearance of KPF switches open (top picture) and closed. Appearance is marked contrast with usual clutter of mechanism.

Simple design and sturdy construction insure years of trouble-free switching

KPF Air Break Switches look different because they *are* different. They are the simplest air break switches made. They consist of two rigid dead-end insulator assemblies with rigid jumpers forming the switch arms. One assembly is mounted stationary to the cross-arm. The other rotates to make and break the circuit. There are no complex parts to get out of order, require lubrication, adjustment or other service. Sturdy KPF switches serve indefinitely.

Simple design also means simpler manufacturing and lower cost. No separate dead-ends or extra insulators are required.

Finally, installation normally requires less than half the normal time. Phase units are shipped ready for use and need only be bolted to the cross-arm.

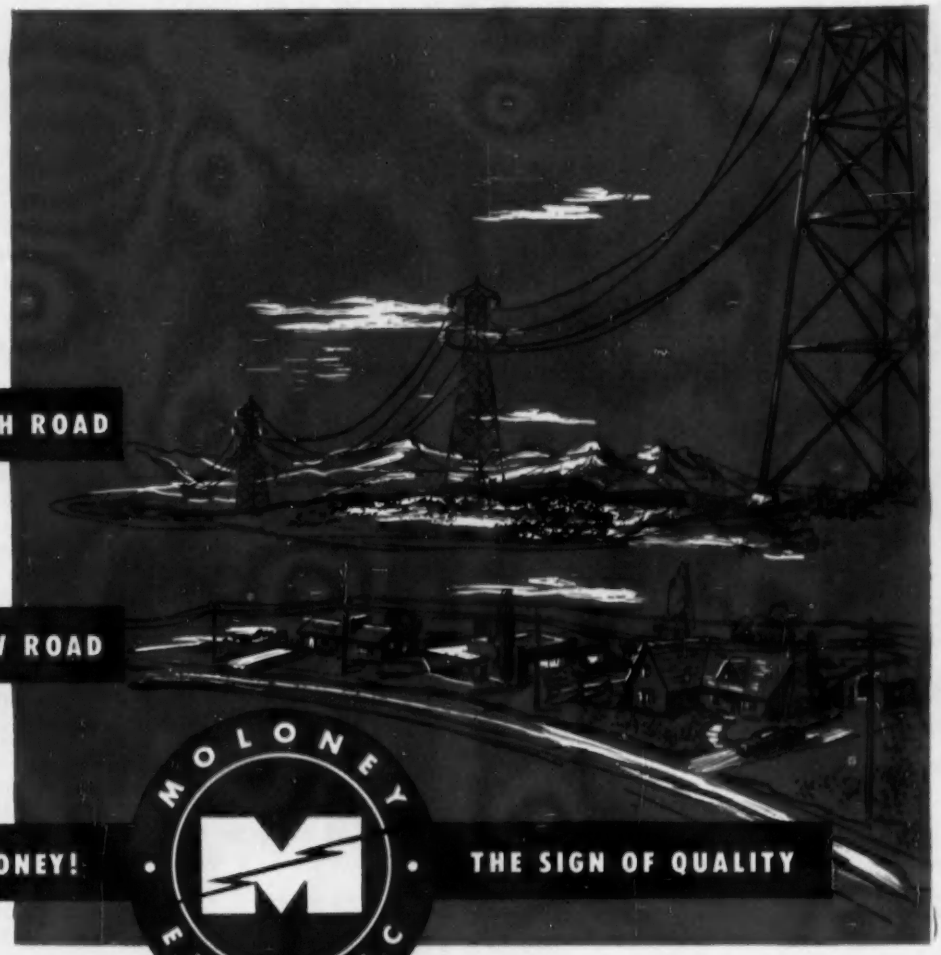
KPF Air Break Switches have been used for almost 50 years on lines ranging from 7.5 to 110 kv. Tens of thousands are in use today by Pacific Gas & Electric, Southern California Edison, Minnesota Power & Light and other leading power companies.

For the world's simplest, surest, lowest cost air break switch, specify KPF Air Break Switches—standard for nearly 50 years.

New catalog gives complete specifications, detail drawings, installation information.

KPF ELECTRIC COMPANY
1624 East Alpine Avenue, Dept. W, Stockton 5, California

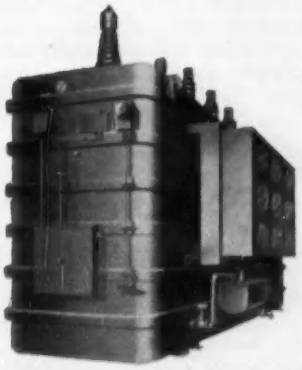
KPF
AIR BREAK SWITCHES
Standard for nearly half a century



Moloney Transformers, proven dependable performers, provide an uninterrupted flow of power . . . up along your high voltage transmission lines . . . down to your lower voltage distribution feeders.

Moloney has paved the highway of high voltage and Kva power transformers in their newly completed manufacturing bay . . . and Moloney HiperCore Transformers have provided dependable avenues of distribution . . . with no detours.

Whether you need high road power transformers . . . or low road distribution transformers . . . make them "Moloney All Along the Line." For Moloney is the "Sign of Quality" . . . of 58 years of experience in the exclusive production of transformers.



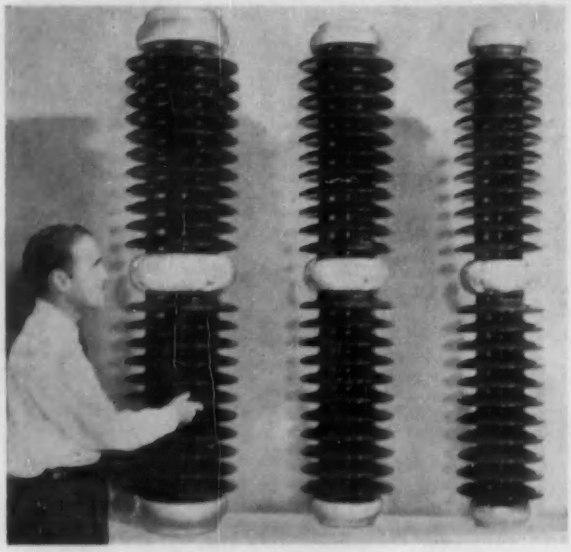
MEE4-48

MOLONEY ELECTRIC COMPANY

Power Transformers • Distribution Transformers • Step Voltage Regulators • Regulating Transformers • Load Tap Changing Transformers • Load Center Transformers • Unit Substations • Network Transformers • Constant Current Transformers • Capacitors • Transformers For Electronics

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA

PRODUCT NEWS



Insulators

(1) Lapp Insulator Co. Inc., Le Roy, N. Y.

The three new 161-kv station post insulators shown in the picture are from left to right: extra high strength unit, rated at 3,500 lb; high strength, 1,700 lb; standard strength unit with 1,200-lb cantilever rating.

These posts are made of two pieces of porcelain rather than the three used previously and are said to have several advantages over the older design. They have standard bolt circles top and bottom, with use of adapters. Regular hex head bolts replace the Allen head screws used previously and four of them assemble a stack instead of the 32 formerly required.

Elimination of joints increases stiffness and improves margins of safety over ratings, both electrically and mechanically, the manufacturer reports. It is also stated that fewer joints and less weight reduce costs of assembly and handling and less deflection under load assures better operation of switches and other equipment.

50-Amp Recloser

(2) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

A new 50-amp recloser, type 50-GR-3, is for use on 2.3- to 15.5-kv distribution systems. The three-pole unit is an addition to the line of 100-amp reclosers and is designed for use where the larger interrupting capacity is not necessary. According to the manufacturer, it is particularly adapted for use with sectionalizers to provide coordinated fault protection on lightly loaded distribution lines. Selective tripping permits choice of one instantaneous and three time-delay trips, two instantaneous and two time-delay trips or four time-delay trips. It is suitable for manual or solenoid operation. The single-tank unit will mount directly on the pole or in the substation.

Electronic Control for Power Stations

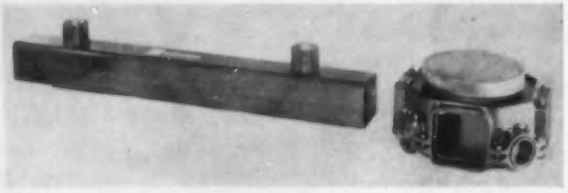
(3) Minneapolis-Honeywell Regulator Co., Industrial Division, Wayne & Windrim Ave., Philadelphia, Pa.

A new automatic "dispatcher" for power stations uses self-correcting electronic controls to regulate a power plant's output and frequency in accordance with electrical demand changes. It is claimed by the manufacturer to be faster acting, more accurate than conventional mechanical systems that are adjusted manually and to be less complicated and expensive than earlier electronic models. Signals to each station require only one channel.

According to the manufacturer, the new system achieves accurate, high-speed control through individual servo units, which supervise three different methods of control. Signals characterizing load swings are telemetered to the servo units. They electronically compare the signals with the standard operating levels and if a discrepancy is detected they initiate control action by adjusting the turbine governors to bring the system load and frequency back to normal.

The individual servos are interlocked, chain fashion, to give cumulative control of the system. Telemetering totalizers are incorporated to tally up the power measurements.

The system can be built into new existing plants, steam or hydro, the manufacturer states. It uses wire, carrier or microwave forms of transmission.



Industrial-Type Underfloor Raceway

(4) National Electric Products Corp., Gateway Center, Pittsburgh, Pa.

Designed for heavy-duty wiring in industrial plants where overhead wiring would interfere with normal operations, this new Nepcoduct underfloor electrical raceway is claimed to have more than three times the capacity of standard underfloor duct. It is a rugged 14-gage cold rolled steel raceway with a 4x4 in. cross section.

According to the manufacturer, the greater capacity allows a greater flexibility in plant layout.

Industrial Nepcoduct is galvanized by the sherardizing process and is further protected with an acid-resistant clear enamel on interior and exterior surfaces.

It comes in standard 10-ft lengths and provides 2-in. pipe size, threaded outlets on 24-in. centers, permitting the direct insertion of conduit for standpipe service fittings. Complete with junction boxes and fittings, it is a fully grounded industrial underfloor wiring system and is UL listed, the manufacturer states.

WHY IT WILL PAY YOU TO USE BELL SYSTEM COMMUNICATIONS SERVICES

You save money

With Bell System services, you get efficient and dependable communications at low cost. You are relieved of maintenance, depreciation and other costs of privately owned communications.

You get the service you need

It's flexible and complete. We furnish communications tailored to your exact needs. No more, no less. A change in number or type of circuits can be made any time to keep your communications in step with changing needs.

You get the best service

The Bell System is constantly developing new equipment, methods and techniques to improve your service and keep your communications from becoming obsolete.

You have more investment money available

Your capital is *not* tied up in communications equipment but is available for investment in income-producing power equipment and services.

You concentrate on your own business

Our business is entirely communications, and that's one reason the Bell System offers power companies the finest services today. A communications study by specialists, made without charge, frequently indicates how a power company can improve its communications and realize increased benefits and economies. Talk this over with the Bell Telephone representative near you.

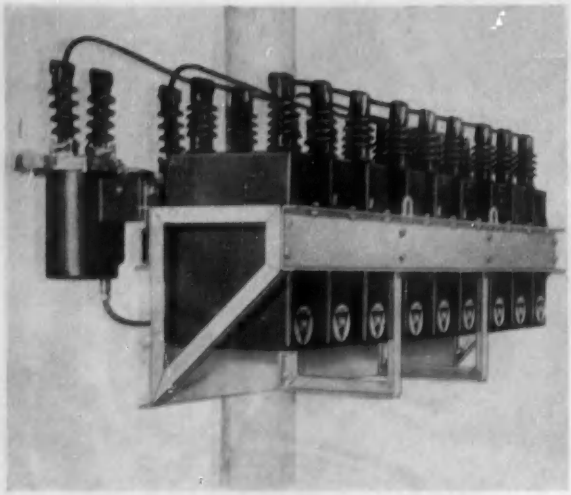
PRIVATE-LINE TELEPHONE

TELETYPEWRITER

MOBILE TELEPHONE

METERING CHANNELS

BELL TELEPHONE SYSTEM



Single-Row Capacitor Racks

(5) Line Material Co., Milwaukee 1, Wis.

Designed for direct pole mounting, new single-row capacitor racks are said to conserve pole space, reduce bending stress on poles, facilitate inspection and maintenance.

These racks are available as complete assemblies, switched or unswitched, and ready for immediate field installation on distribution systems rated 2,400 to 13,800 v. Bank sizes may be 225 or 300 kvar. Mounting positions for NR switches are changeable to meet various primary circuit configurations and a junction box provides a single connection point for control wiring.

Other features listed are coordinated bird proofing, disconnect plug on NR switches, a lifting yoke.

Insulation Testers

(6) James G. Biddle Co., 1316 Arch St., Philadelphia 7, Pa.

Two new Megger models are available in rectifier-operated units. One has a range up to 100,000 megohms at 5,000 v d-c with 1,000 v and 2,500 v intermediate ranges and one has a range up to 200,000 megohms at 10,000 v with no intermediate voltage ranges. The motor-driven and hand-operated instruments are still available with ranges up to 50,000 megohms, 2,500 v d-c.

According to the manufacturer, the high ranges are being found useful in field tests on bushings, generators, transformers and cables. Details are in bulletin 21-2011.

Improved Formulation for Plastic Tubing

(7) Irvington Varnish and Insulator Division, Minnesota Mining & Mfg. Co., Irvington, N. J.

An improved formulation for its black Temflex 105 plastic tubing has been announced by this manufacturer. The tubing is UL listed for continuous operation at 105 C.

The modified formulation is said to give improvement in heat deformation characteristics and greater resistance to "cut through." In addition it provides enhanced color stability under sustained operation at high temperatures, according to the manufacturer, who states that excellent electrical characteristics and heat aging properties have been retained in the new tubing. Samples are available from the manufacturer's sales promotion department.

Center Break Switches Redesigned

(8) R&IE Equipment Division, I-T-E Circuit Breaker Co., Greensburg, Pa.

This type DR center break air switch has been completely redesigned and features characteristics common to other R&IE horizontal and vertical break switches.

Sealed pressure hinge contacts have replaced flex connections at the swivel jaw and swivel hinge terminals. Pressure finger jaws designed with a combination copper and beryllium copper provide for high conductivity, strength, resiliency and high thermal capacity, the manufacturer states. Both hinge and jaw construction are identical in parts with those of the manufacturer's vertical break switches.

The new type switch is built in voltages from 7,500 through 161,000, with current ratings from 400 through 1,200 amp.

Irradiated Polyethylene Tape

(9) General Electric Co., Chemical Development Department, Pittsfield, Mass.

Irrathene 201 irradiated polyethylene, a new stabilized type of irradiated polyethylene tape, is being used in the manufacturer's Switchgear and Control Division as turn insulation for blowout coils on its Magne-Blast circuit breakers. It has been stabilized for continuous use at high temperatures ranging from 105 to 125 C, depending on the nature of the electrical apparatus application, according to the manufacturer. It is stated that this application is a fundamental use for the insulation and that the new tape could be applied to most types of electrical apparatus and machinery. It is described as combining high dielectric strength with good thermal and mechanical properties needed for circuit breaker operation.

New Line of Safety Switches

(10) Federal Pacific Electric Co., 50 Paris St., Newark, N. J.

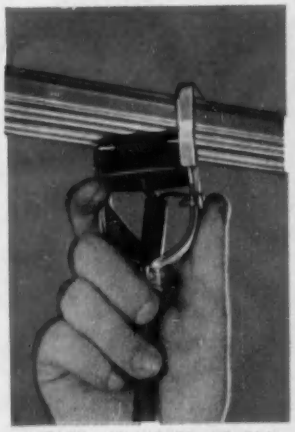
A new and improved line of type D (NEMA type G) safety switches is available in 30-, 60-, 100-, 200-, 400- and 600-amp capacities.

The 30-amp line of type D safety switches now has the features of the other Federal Noark switches, it is reported, making them easy to install and maintain and giving long life. Styling of enclosures is modern and uniform.

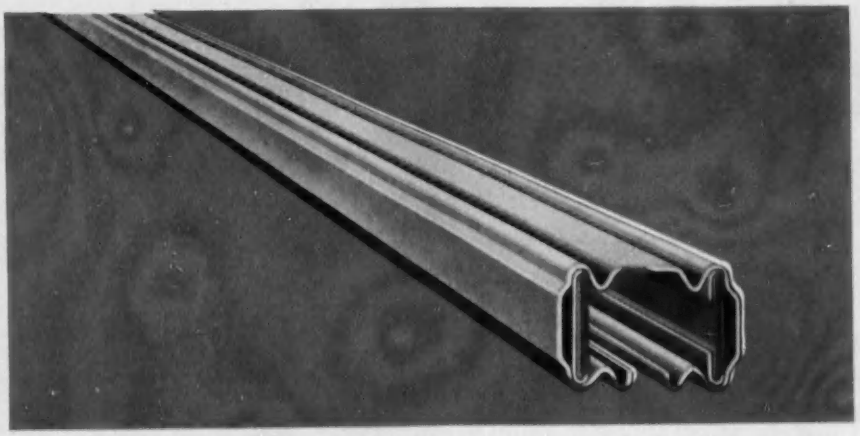
These switches feature solderless lugs and feed-through neutral for quick installation. Ample gutter space is provided, the manufacturer states, and visible knife blades and completely recessed live parts are safety features. Dual blade construction, fewer joints, visible moving parts and contacts are other features listed.

The switches come in uniformly styled raintight enclosures with mounting ears to facilitate installation on posts and irregular surfaces. A metal name plate with complete switching data is mounted on the cover. They are UL listed and suitable for use as service equipment, it is stated.

For Additional Information
Fill in the Coupon on Page 56



A TWIST AND LIGHTS ARE CONNECTED. Twistout Plugs give positive, safe connections in seconds.



IT'S A CONTINUOUS OUTLET. Cutaway view shows how copper bus bars run the entire length of Universal Trol-E-Duct, making it every inch an outlet. Moving trolleys that roll effortlessly on steel wheels are also available to bring mobility to small power tools.

BULLDOG UNIVERSAL TROL-E-DUCT

Feeds Lights Supports Them, too!

YOU GET COMPLETE MOBILITY WITHOUT DOWNTIME OR REWIRING

Avoid the expense of suspending lights separately. Sturdy Universal Trol-E-Duct®—the original bus bar system for lights and small power tools—supports lights in addition to supplying *flexible* power to operate them.

Movable weight supports let you position lights where you want them. Twistout Plugs tap power anywhere along the duct. You can arrange, change, add or remove lights as desired—without rewiring, power shutoff or downtime. You save on over-all costs . . . get a safer, more efficient system.

Investigate the double utility, double value of BullDog Universal Trol-E-Duct.

Call your BullDog Field Engineer or Qualified Distributor for all the facts. Or, write: BullDog Electric Products Company, Detroit 32, Michigan. ©BEPCO

IF IT'S NEW
. . . IF IT'S DIFFERENT
. . . IF IT'S BETTER . . . IT'S

BULLDOG

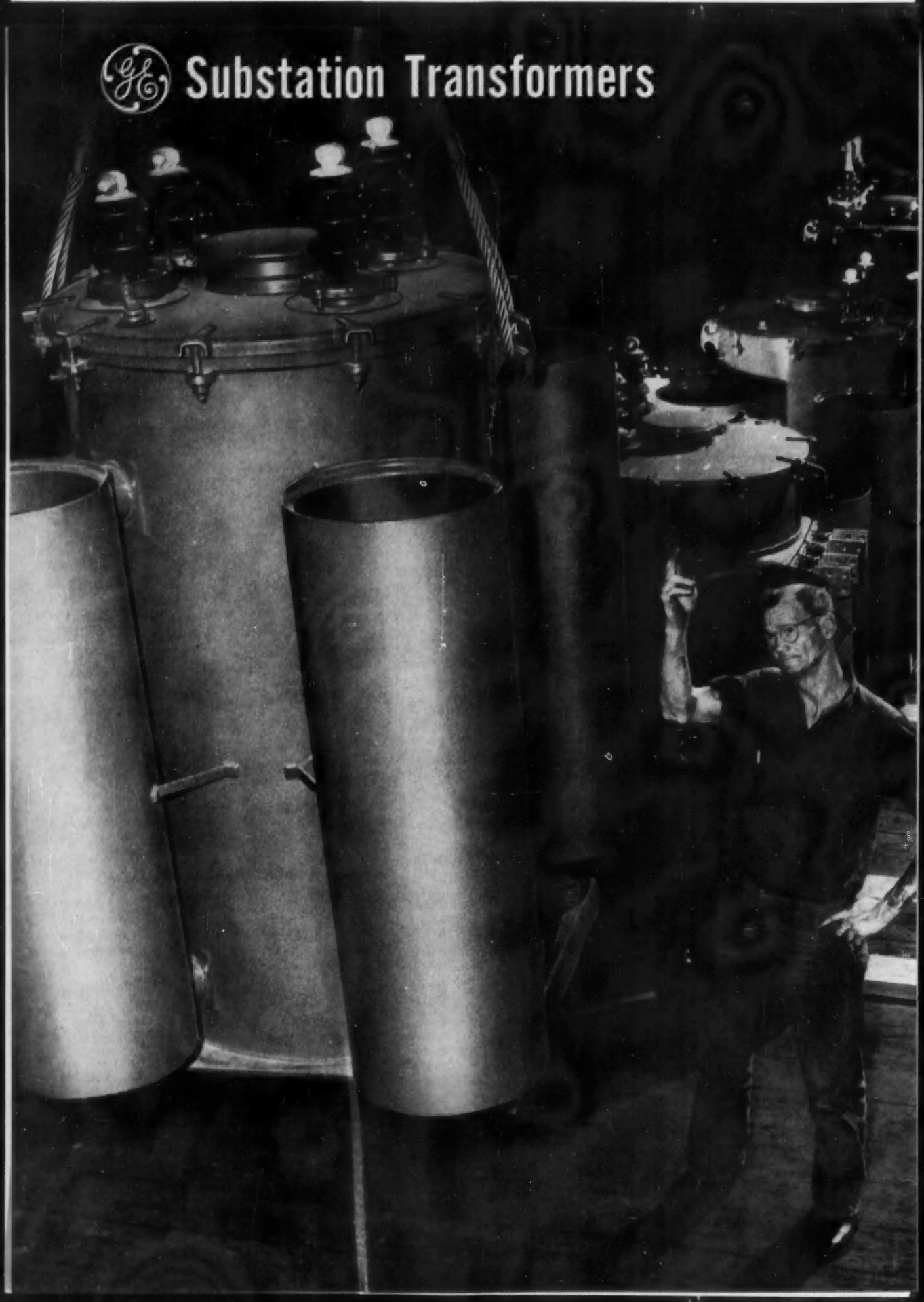
ELECTRIC PRODUCTS COMPANY
A Division of I-T-E Circuit Breaker Company

Export Division: 13 East 40th Street, New York 16, New York. *In Canada:* BullDog Electric Products Company (Canada), Ltd., 80 Clayson Road, Toronto 15, Ontario.

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

Coast Electric & Manufacturing Co., 1733 N.E. Seventh Avenue, Portland 12, Ore. • BullDog Electric Products Co. of Los Angeles, 2885 E. Washington Blvd., Los Angeles 23, Calif. • Safety Switchboard Company, 910—89th Avenue, Oakland 21, Calif. • Young Electric & Mfg. Co., 2134 Curtis St., Denver 2, Colo.

Substation Transformers



Here comes the new look in substation transformers

G-E Chimney Radiators Cut Height 30%, Weight 10%

The new General Electric substation transformer, developed after extensive research on methods of cooling, makes possible important savings in installation and maintenance costs and, in addition, offers increased reliability.

Installation Costs Cut—For example, since height is reduced about 30%, you can install a new 250-kva unit where you now have a 100-kva unit—headroom requirements for both units are the same. This enables you to make sizeable savings because, in most cases, you can install higher rated transformers to meet load growth without enlarging your present installation facilities.

The average 10 per-cent reduction in weight and lowered center of gravity make for easier handling, further simplifying installation.

Maintenance Costs Also Cut—Repainting is easier than with conventional tanks because you paint a few large, smooth surfaces instead of many small, round tubes, complexly arranged.

Reliability Increased—Offering the same excellent electrical characteristics as the previous design, chimney-radiator substation transformers are stronger and offer less chance for oil or Pyranol* leaks than conventional units because there are fewer openings into the transformer tank.

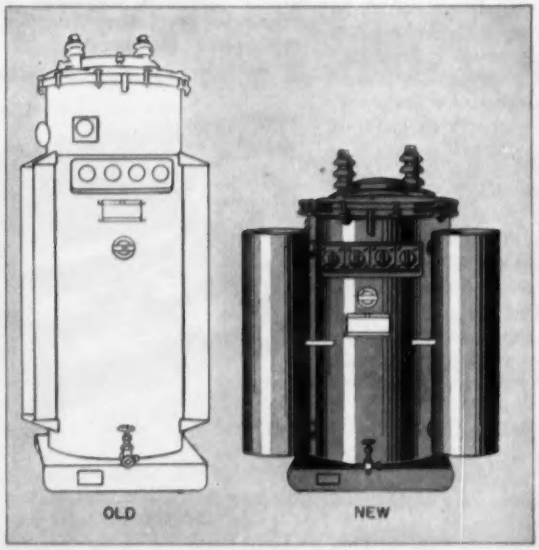
Availability—G-E chimney-type substation transformers are currently available in ratings of 250, 333, and 500 kva, in voltages up to 69,000 volts. For further information, write Section 431-14, General Electric Company, Schenectady 5, N. Y.

*Reg. Trademark of General Electric Company

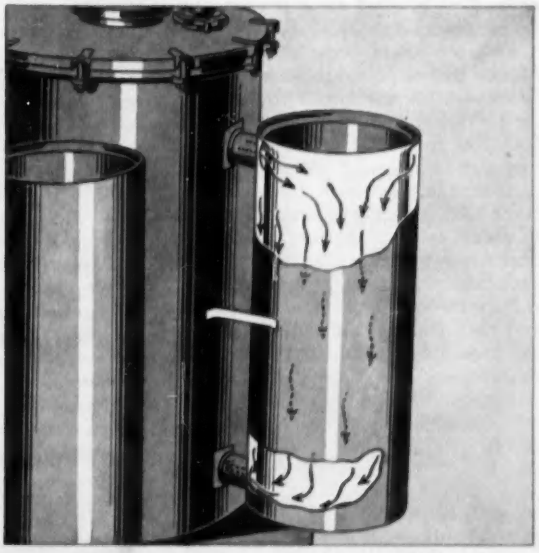
Progress Is Our Most Important Product

GENERAL ELECTRIC

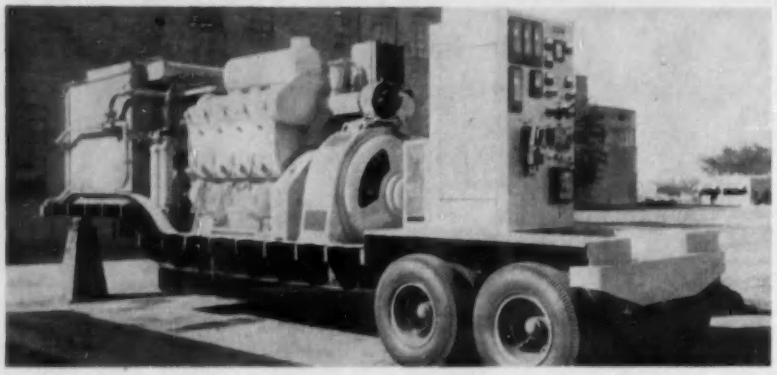
With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.



CUTS HEADROOM REQUIRED BY ABOUT 30%.—Where clearance is important the new G-E design is a big help because it reduces transformer height as much as 2½ feet.



MORE EFFICIENT COOLING.—The new G-E transformer has four simple, efficient cooling "chimneys." With fewer tank openings, there is little possibility of oil leaks.



Above: 500-kw mobile highway unit with doors open to show the 800-hp diesel engine. Below: 500-kw unit for transport without car body. It uses same 800-hp prime mover

New Mobile Unit Was Designed for Fringe Areas

(11) Electro-Motive Division, General Motors, La Grange, Ill.

A new type of mobile power generating plant is designed to help power companies meet unusual demands that are so seasonal, temporary or low in load factor that it is not economic to extend an original or a second line. Prime mover is a 567C diesel engine.

Five models of these new Electro-Mobile power units are being offered. Three are for use over railroads, two on highways. The railroad units are of 500, 750 and 1,000 kw capacity; the highway units are of 350 and 500 kw capacity. According to the manufacturer, the units may be coupled rapidly to obtain any capacity required, even that necessary to put an average city back into operation after a disaster.

Pilot models of the 500-kw highway and the 1,000-kw railroad unit are being loaned for try outs on a coast-to-coast tour.

The manufacturer is also offering four models of a new portable generating plant utilizing the same diesel engine and other major components used in the mobile plants. These units, on skids and capable of being put on railroad cars or truck trailers for transport, are designed for more permanent installations. They are of 350, 500, 750 and 1,000 kw capacity.

A new line of A series generators has been designed for use in the mobile and portable units. These generators will withstand a 25% overload and will operate at 4,160 or 2,400 v, the manufacturer states. An improved insulation utilizing silicone, glass and mica is designed to withstand intermittent operation in varying weather conditions.

Automatic control apparatus to make the units completely self-operating at far outlying points is available. The units can be controlled by a central operator, hundreds of miles away, by impulses over a wire or by radio or can be started or stopped by fluctuations in voltage on the line being served. Total time from starting impulse to full load is approximately 45 seconds, it is pointed out.

A special exhaust manifold has been developed for the diesel engines to meet low noise level requirements for operation in residential areas. To further reduce noise perforated soundproofing material was used to line the entire car body.

(12) **LINEMAN'S SHELTER** — A one-man tent made of Bakelite Krene weighs 13 lb; is said to be easy to put up and take down. It is waterproof and will not burn, its manufacturer states. Dielectric strength is 9,600 to 16,000 v, depending on thickness of material. Insulation resistance has been measured at 1.4×10^6 megohms per cubic centimeter. Made by Plastimayd Products Corp., 931 S. E. Sixth Ave., Portland 14, Ore.

Electrical Conduit

(13) National Electric Products Corp., Gateway Center, Pittsburgh, Pa.

Superduct is a new heavy-duty rigid steel electrical conduit designed to give long life under very severe corrosive atmosphere. Like the manufacturer's Sherarduct steel conduit, Superduct is galvanized by the sherardizing process. It is then coated with a special vinyl chloride copolymer, pigmented and plasticized enamel finish, inside and out.

According to the manufacturer, tests by an independent laboratory corroborated findings in its own plant on the product's ability to withstand attacks of sulphuric acid, caustic lye, salt spray and heat.

Tool

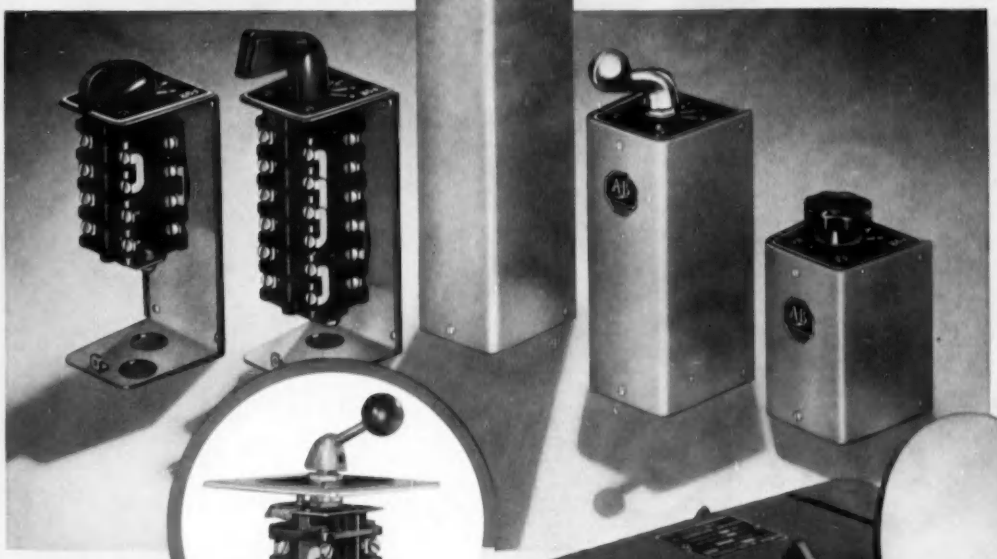
(14) The Thomas & Betts Co., Elizabeth, N. J.

Armored (BX) electrical cable as well as copper and aluminum conductor to 4/0 AWG can be cut cleanly without a hacksaw with the new No. 364 cable cutter, its manufacturer states. Similar in design to the larger No. 365, the new cutter has specially ground and hardened, blunt cutting edges. Its blades are of forged steel with ⅛ in. overlap, allowing repeated sharpening. Together they form a heart-shaped opening that gives a sliding, slicing action that forces the cable toward the tool's fulcrum. This is said to reduce the required cutting effort and to eliminate burring or deforming the cable, which retains its round shape.

(15) SAMPLE CASE—In National blue, this jewel-box case is used to display conduit samples by Spang-Chalfant Division of The National Supply Co. Samples are cut away to show inner construction. Manufacturer's address is 416 Gateway Center, Pittsburgh 30, Pa.

(For More Data, Use Coupon, Page 56)

DRUM SWITCHES



Bulletin 363 MULTISPEED DRUM SWITCHES for 2, 3, and 4 speed motors.

Bulletin 806 DRUM SWITCHES for pilot control and transfer switch service.

Open View of Bulletin 350 Drum Reversing Switch on Worthington welding positioner. Available up to 20 hp, 220 v; 40 hp, 440-550 v. For d-c motors up to 3 hp, 115-230 v.

MANUAL CONTROLS

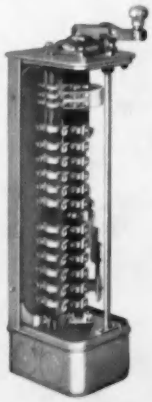
for Alternating & Direct Current Motors

There are many types of motor-driven machines for which a simple drum switch is the most suitable type of manual control. For such applications the Allen-Bradley line offers a wide variety of types and sizes of drum controllers up to 300 hp, 220 v; 500 hp, 440-550 v.

Practically any combination of switching operations can be arranged by the proper combination of drum segments and contact fingers. For complete information on Allen-Bradley drum controllers, send for the 120-page Allen-Bradley Handy Catalog.

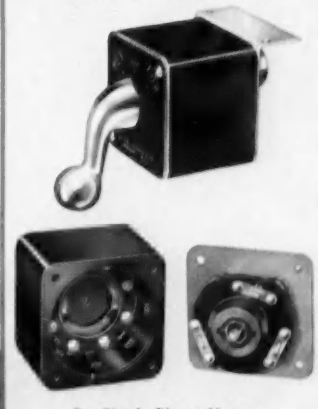
Allen-Bradley Co.
1316 S. Second St.
Milwaukee 4, Wis.

In Canada—
Allen-Bradley Canada Ltd.
Galt, Ontario



Bulletin 375-385 DRUM SWITCHES for polyphase, wound rotor induction motors.

Bulletin 350 Low Cost STYLE A DRUM SWITCHES for polyphase motors up to 1½ hp, 110 v; 2 hp, 220-440-550 v.



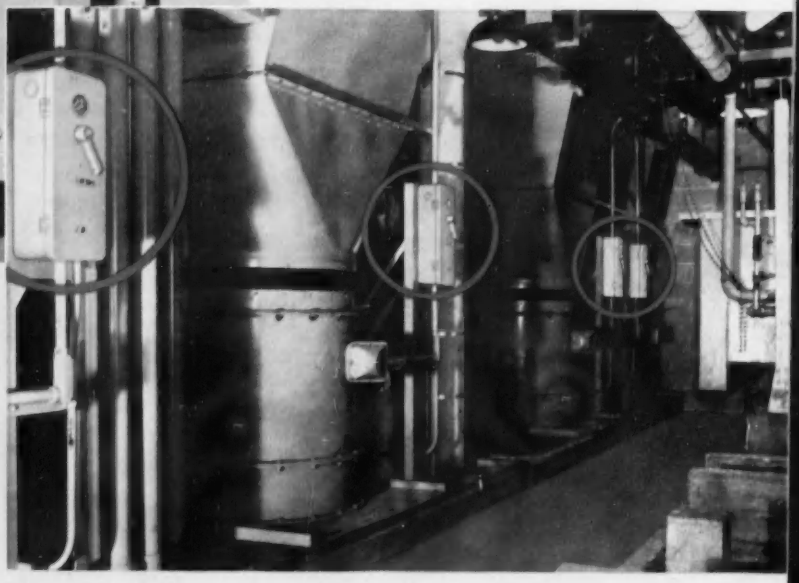
For Single Phase Motors up to 1 hp, 110 v; 1½ hp, 220 v. D-C motors—¼ hp, 110-220 v.

ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

1-55-M

A neat, compact line-up of Allen-Bradley Bulletin 712 combination starters in the control room of a large chemical processing plant. Starters can be padlocked in "OFF" position.

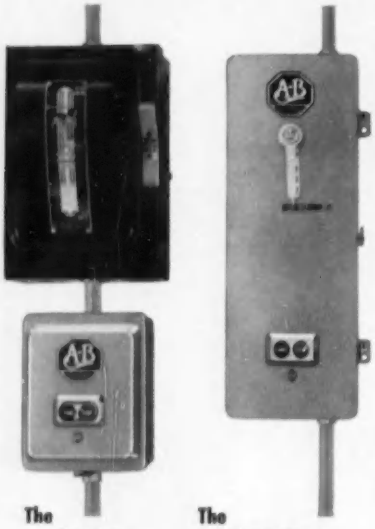
A row of Allen-Bradley Bulletin 712 combination starters in metal finishing plant. Note the simplified wiring which is possible when disconnect unit is in same enclosure with starter.



ALLEN-BRADLEY COMBINATION STARTERS

Save wiring costs
Save Space

Assure safer and neater motor controls



The **OLD** Way

Separate disconnect mounted above and wired to motor starter. Difficult to do a neat appearing wiring job.

The **MODERN** Way

Bulletin 712 combination starter with disconnect. Cannot be opened unless disconnect lever is "OFF."

STREAMLINE your MOTOR CONTROLS

by using A-B Combination Starters

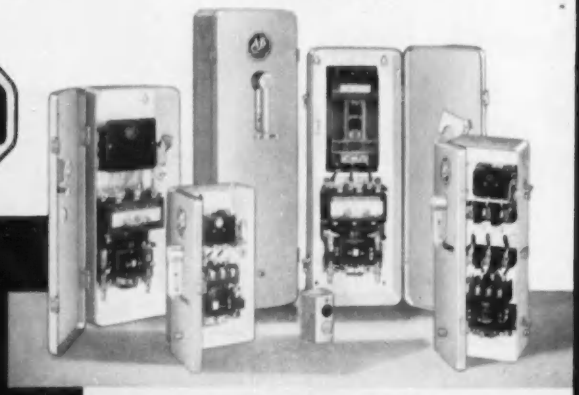
The Allen-Bradley line of combination starters is available in two general types—Bulletin 712 with manual disconnect switch and Bulletin 713 with automatic I-T-E circuit breaker. In addition to the standard NEMA Type 1 pressed steel enclosure, these combination starters are furnished in watertight, dust-tight, and semidust-tight enclosures, as well as in enclosures for hazardous gas and dust locations. For complete information, please write for the Allen-Bradley 120-page Handy Catalog.

Allen-Bradley Co.
1316 S. Second St.
Milwaukee 4, Wis.

•

In Canada—
Allen-Bradley Canada Ltd.
Galt, Ontario

A-B Quality



Allen-Bradley Combination Starters

1-55-M

ALLEN-BRADLEY
COMBINATION STARTERS
QUALITY

Stainless Steel Valve

(16) Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.

Stainless steel solenoid-operated two-way valves with high resistance to corrosion were designed to control gases and liquids generally corrosive to bronze, steel or iron at pressures to 250 psi. These bulletin 8265 valves are normally closed (close when de-energized, open when energized).

They have heavy-duty construction throughout; are suitable for operation at a frequency of 400 times per minute. Solenoids are of floating core construction. All internal parts are accessible without removing valve body from pipe line. Continuous-duty class A coils for temperatures to 212 F are provided. High-temperature class H coils are supplied for temperatures to 450 F. Available in ⅜ in. IPS solenoid enclosures to meet NEMA standard watertight requirements.

Instrument Recording Pen

(17) Bailey Meter Co., 1050 Ivanhoe Road, Cleveland 10, Ohio

A new instrument recording pen is claimed to speed data interpretation and relieve skilled personnel of monotonous duties. The featherweight, stainless steel capillary pen is fed from a clear, hermetically sealed, plastic ink sack that contains more than a year's supply. Capillary action maintains continuous flow to a precision ground point that traces a sharp, opaque, quick-drying record, the manufacturer states. As many as four pens trace on parallel time arcs only 42/1,000ths of an inch apart. The sealed inking system is said to prevent sludge and oxide formation. Chart sample and product specification E12-5 are available on request.

Filler Tape

(18) Bishop Mfg. Co., 46 Factory St., Cedar Grove, N. J.

A black filler tape recently put on the market is described as an insulating compound in the form of a thick tape, wound together with a fabric separating strip to form a roll. It is designated No. 125 electrical filler tape.

Areas to be built up can be thumb-molded to shape and thicknesses pressed on at low spots with pieces of the filler compound torn from the roll and rapidly squeezed to correct dimensions, its manufacturer states.

It is claimed to be practical for covering sharp cornered electrical connections and padding the edges of bus bars. It comes in rolls 1½ in. wide, with a tape thickness of ⅛ in.

Guy-Grips*

BY PREFORMED

...Economical

...Neat

...Efficient

*at the left

PLP PREFORMED LINE PRODUCTS CO.
5349 ST. CLAIR AVE. • CLEVELAND 3, OHIO

HOW TO MAKE BETTER *Electrical* CONNECTIONS

1 SELECT

the correct connector. A *connector* . . . Kearney or the cheapest . . . doesn't cost much. But a *connection* . . . completed and on your line . . . is worth hundreds of dollars. It just doesn't pay to take chances. Start out right by using a Kearney connector engineered for your job, and then . . .

COMPRESSION CONNECTOR

Built for today's loads, the Squeezon is easily installed with either the hydraulic or mechanical tool. Made in both copper and aluminum.

SPLIT BOLT CONNECTOR

The tried and proved connector with a 27-year service record. Designed for a wide variety of applications on every wire material.

PARALLEL GROOVE CLAMP

High strength clamp provides conductor separation, large contact area. Easily installed with single wrench. Wide size range.

TWO BOLT CLAMP

Available with or without spacer, the Kearney Pressurite Clamp provides a compact, convenient means to tap larger size conductors.

2 CLEAN

the conductors. Use the Kearney Cleaning Brush to remove all traces of oxidation or corrosion. Available with sure grip handle or with fit-on attachment for hot stick use, this time and trouble saver makes certain you get good contact initially. But, you have to . . .

Pioneers in the Field

Modern manufacturing facilities help keep your operating costs down.

Specify **KEARNEY**

JAMES R. KEARNEY CORPORATION • Office and Factory

HOW TO KEEP A GOOD *Electrical* CONNECTION

3 PROTECT

these cleaned surfaces against future corrosion. Kearnalene gives you two-step connection protection. (1) It penetrates any remaining surface oxide; forms a permanent conducting path, and (2) effectively acts as an inhibitor; prevents further corrosion. Finally . . .

4 SEAL

out all trouble by sealing out air from contact surfaces. Airseal prevents galvanic action by eliminating the electrolyte. Easy to apply, it is a pliable, removable, high dielectric compound. Airseal is supplied in five convenient sizes of pads and rolls.

of Solderless Connectors for Power Lines

TWENTY-SEVEN years ago the Kearney Corporation introduced the first solderless power connector. Three years ago Kearney completed development of the first practical compression connector.

And now, of all the connector manufacturers, only Kearney supplies all four of the materials shown above . . . items field-proved to be necessary for making lasting, trouble-free connections.

Standardize on this simple, complete four-step Kearney Connection System. Universal in application, it is designed for use on any conductor material, copper, aluminum, ACSR; on any kind of connection, tap, tension splice, terminal, stirrup, bus fitting, hot line clamp, ground clamp; in any kind of atmosphere, hot, cold, corrosive, wet or dry.

Kearney pioneering will continue. Kearney research, based on experience, will be ready to solve your connection problems as they arise. Look to Kearney for the answers.

MAYDWELL & HARTZELL, *INCORPORATED* • **WEST COAST DISTRIBUTORS**

Los Angeles • San Francisco • Portland • Seattle • Spokane • Phoenix

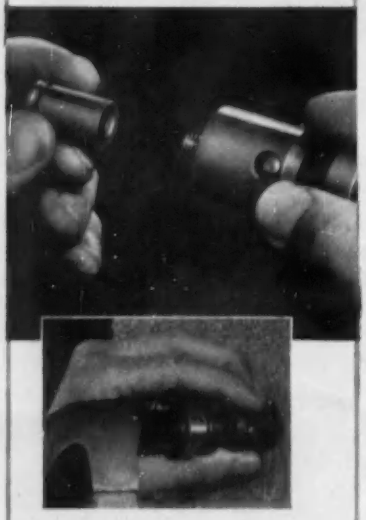
254W

Products *for Better Construction . . . Safer Maintenance*

4224-42 CLAYTON AVE., ST. LOUIS, MO. • *Canadian Plant:* GUELPH, ONTARIO

NEW, IMPROVED TYPE

screw anchor expanders



quickly set anchors in masonry of any thickness, holes in varying depth

Now, with the GREENLEE Screw Anchor Expander you can rapidly and *securely* set lead screw anchors *flush* with the surface of masonry . . . *regardless of its thickness . . . regardless of hole depth.* Eliminates all guesswork . . . the expander tool positions the anchor *positively* every time. Fast, easy operation. Simply drill hole, screw lead anchor onto expander, insert in hole, then strike the expander head with hammer or mallet. It is the ideal tool for setting anchors to hold meter boxes, lighting fixtures, hangers, and other equipment. Three sizes for the most widely used sizes of screw anchors. Write for descriptive folder.

GREENLEE

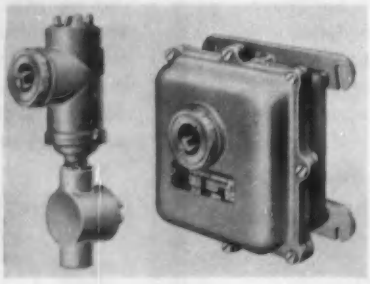
GREENLEE TOOL CO.

1761 COLUMBIA AVE., ROCKFORD, ILL.

Coupling

(19) Killark Electric Mfg. Co., Vandeventer & Easton Ave., St. Louis 13, Mo.

Designed for wiring installations in vibration areas, a flexible coupling recently introduced by this manufacturer is explosionproof, UL listed. It is for hanging explosionproof fixtures or for installation of motors. According to the manufacturer, it can't shake loose. Base and fittings are of solid brass. It comes in all combinations of hubs; conduit diameters from ½ to 2 in., any length. The manufacturer will make to order any coupling size or diameter.



Controls

(20) Crouse-Hinds Co., Wolf & Seventh North St., Syracuse, N. Y.

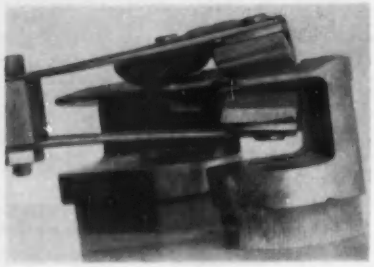
A new system of explosionproof Condulets, consisting of a light source transmitter and a photoelectric tube receiver, permits automation at hazardous locations, the manufacturer has announced. The system automatically activates or turns off lights, starts or stops motors, totals assembly line output or controls a number of other electrical or electronic devices.

Light is provided by type EPL 243 Condulet (shown left in photo); light detection by type EPA 342 Condulet (right), a light-sensitive electronic control relay. Whenever the appearance or absence of light is detected through a lens by the receiver's photoelectric tube, a relay opens or closes the electrical circuit.

Completely explosionproof and classified by UL for use at class 1, group D hazardous locations, the unit has a cast feraloy cover and housing. Flame-tight threads connect the lens assembly to the cover. For additional strength, the ground joint cover is bolted to the housing body.

(21) **TRENCHER**—A new heavy-duty trenching machine is offered by Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, Ohio, in its model 240 full-crawler-mounted wheel-type model that digs up to 36 in. wide and to a depth of 6 ft 3 in.

'For More Data, Use Coupon, Page 56)



Tap Changers

(22) Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Newly developed tap changers for de-energized operation are now standard equipment on the manufacturer's large transformers. Principal features of the new mechanism are the design of its contact area and a flexible action that maintains equal pressure on moving members to make them self-aligning.

Springy arms hold a pair of rounded, movable, solid copper bridging contacts firmly against a cylindrical shaped stationary contact. The stationary contacts are located in a semicircle around the tap changer panel assembly ready to receive the movable contacts as the operator changes the bridging arrangement. Design is such that no current passes through the springs, it is stated.

When taps are changed, even after a long period in the same position, excellent contact of the rounded surfaces is established by the pressure, which helps the surfaces wipe off any oxidized materials during the tap changing operation, it is claimed. This constant pressure reduces possibility of rise in resistance and overheating through spreading of contactors.

On three-phase transformers, the tap changers are operated in all phases from a single external handle. This insures against one phase being connected differently than others. Liberal clearances and insulation are designed into the internal assembly so that it will withstand standard overvoltage conditions with ample tolerance, it is reported.

The tap changer assembly is easily accessible for periodic inspection through manholes in the tank cover.

(23) **RECORDER**—A wide-strip electronic recorder for measuring and recording both current and voltage simultaneously on one chart has been introduced by The Bristol Co., Waterbury 20, Conn. Primary measuring elements of the instrument are a thermal-voltage converter and a thermal-current converter, a-c/d-c transducers. It is said to have exceptionally fast response time, coupled with accuracy within 1% and sensitivity of 1/20th of 1%.

even in
an age of speed...
sheer velocity is not
always an asset...

...in fact
there are some
instances...

...where it's
a real
liability!

take low disc speed in a meter . . .

Speed is definitely not an asset in the turning rate of a watt-hour meter disk.

That's why the disk in the Sangamo J2 Watthour Meter revolves at a low, low rate of speed—only 10 revolutions per minute at the nameplate rating of 15 amperes. And only 66⅔ revolutions per minute or approximately one revolution a second when the J2 is busy measuring a full load of 100 amperes. Yet the J2 has exceptionally high driving power.

This means the Sangamo J2 lasts longer and requires less maintenance than ordinary meters . . . there's less wear on all moving parts.

It means good public relations, too. Mr. Customer doesn't like to see his meter spin.

A METER WITH STRAIGHT LINE ACCURACY

UP TO 100 AMPERES

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

JM54-10

ALL NEW G-E CAPACITOR

Field-tested assembly over *50* percent stronger handles one or two copper or aluminum lines; exerts 1000 lbs. contact pressure through corrosion resistant connector.

Every General Electric outdoor capacitor with glass bushings now has a stronger terminal that's far easier to handle.

Here are the details that give this sturdy new terminal its practical advantages:

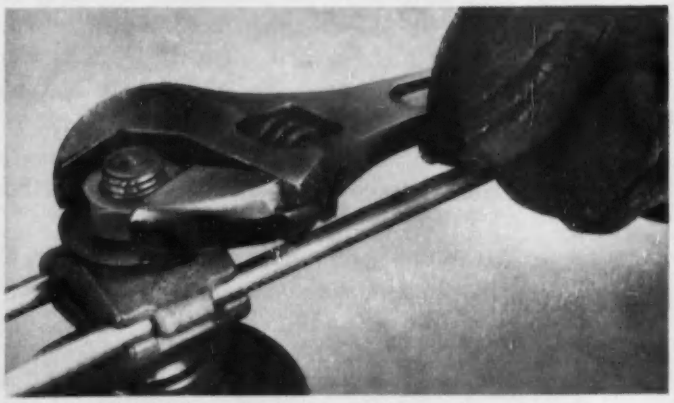
1. Conductors can be quickly inserted in the assembly without threading. **2.** One or two copper or aluminum conductors from No. 10 AWG solid to No. 2 AWG stranded can be clamped securely. **3.** Two Belleville washers exert a constant pressure of over 1000 pounds, forcing the parallel-groove connectors to follow the cold flow of aluminum. **4.** The hex nut will strip without damaging the terminal stud if excessive tightening torque is applied. It can easily be replaced with a new nut. **5.** Accidental loss of this nut is reduced because the top threads on the terminal stud are staked. Yet, if necessary, the nut can be forcefully removed. **6.** The parallel-groove connector is tin-plated to provide good conductivity and minimize corrosion.

Every element of this design has produced a strong and dependable terminal assembly requiring a minimum of time and effort to connect. Ask your G-E Apparatus Sales Engineer for more information. General Electric Company, Schenectady 5, New York. 441-23

Progress Is Our Most Important Product

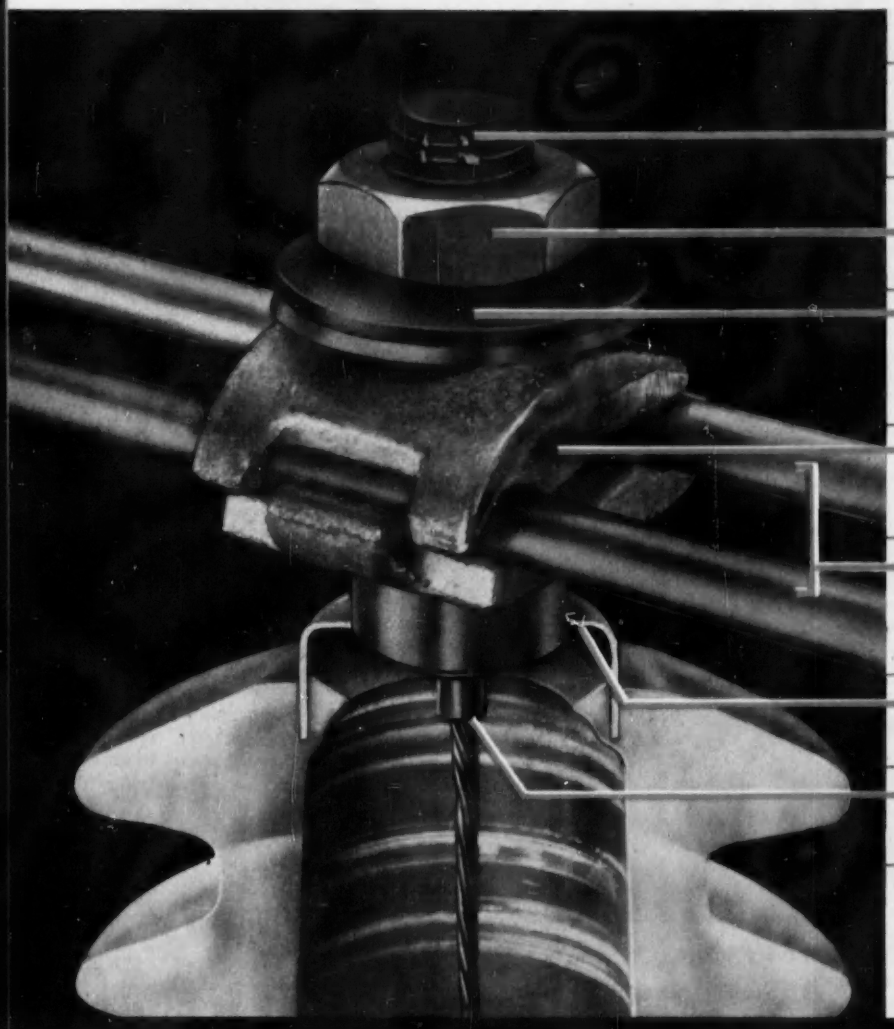
GENERAL ELECTRIC

NO THREADING of conductors is needed with parallel-groove connector. Loosen nut and conductors slip in place.



BELLEVILLE WASHERS maintain over 1000 pounds contact pressure on connector. Flat washers indicate proper torque.

TERMINAL *at no price increase!*



STAXED THREADS
keep assembly from being accidentally removed

NUT STRIPS FIRST
if excess torque is applied, avoiding damage to stud

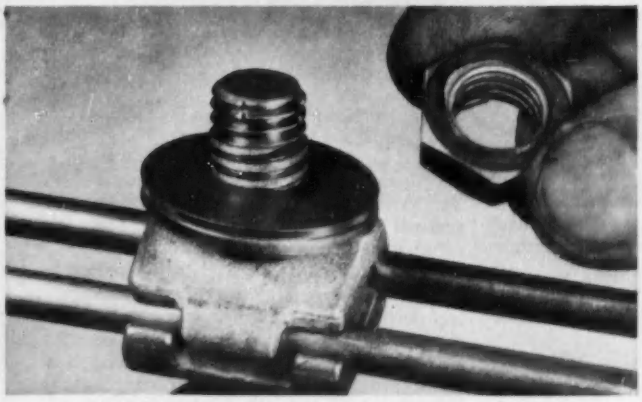
POSITIVE CLAMPING
with Belleville washers follows cold flow if aluminum conductors are used

TIN-PLATED CONNECTOR
provides good conductivity and minimizes corrosion

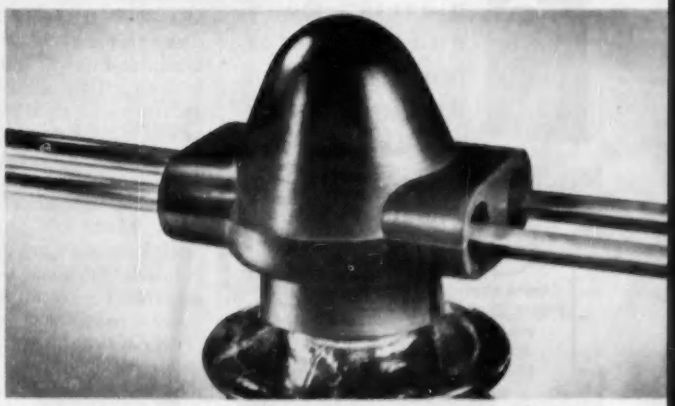
HOLDS 1 OR 2 AL OR CU CONDUCTORS
from No. 10 AWG solid to No. 2 AWG stranded

PRESSURE-BRAZED TO CAST-IN-GLASS FLANGE

CRIMPED AND BRAZED LEAD-WIRE CONNECTION

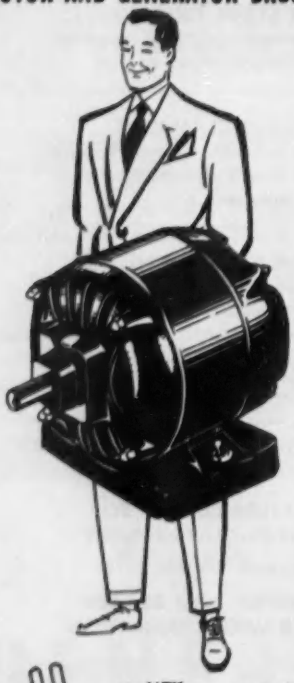


NUT STRIPS BEFORE THE STUD, preventing damage to stud threads due to excess torque. Nut can easily be replaced.



PROTECTION against birds and rodents is provided by this rubber cap which fits securely over the entire assembly.

I'M SOLD
ON OHIO
MOTOR AND GENERATOR BRUSHES



• "They meet my most exacting requirements and conditions. I know that expertly engineered motor and generator brushes lengthen the life of a motor and increase it's efficiency. That's why I'm an OHIO customer."

ORDER YOUR CARBON BRUSHES FROM A SINGLE SOURCE

West Coast Representative
C. F. BOWERS
544 S. San Pedro St.
Los Angeles 13, Cal.

THE OHIO CARBON COMPANY
12508 BEREA RD., CLEVELAND 11, OHIO

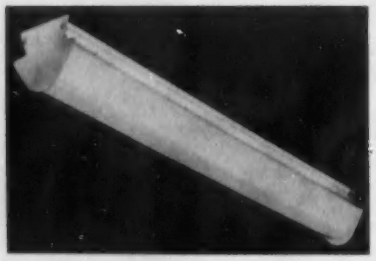
Luminaires

(24) Line Material Co., Milwaukee 1, Wis.

Ovalite luminaires with service-safe sockets for application to multiple or series, mercury vapor street lighting circuits are available with refractors for type III or IV light distribution. They were designed to give maintenance economies and facilitate installation; have safety features.

The lamp and socket of each luminaire are parts of the hinged refractor assembly and are immediately de-energized and isolated from the circuit as the luminaire is opened. Series luminaires incorporate make-before-break contacts that eliminate arcing while maintaining circuit continuity. The same make-before-break action is employed when the luminaire is closed.

Ovalites for multiple circuits accommodate A-H1, E-H1 or C-H5 mercury vapor lamps or their color-improved versions. Ovalites with the service-safe feature for series circuits accommodate E-H1 and J-H1 lamps. They are adaptable to horizontal or pendant mounting.



Corridor F Fixture

(25) Sylvania Electric Products Inc., 1740 Broadway, New York 19, N. Y.

Designed primarily for use in corridors, this new fluorescent fixture is available in one- and two-lamp units; is designed to blend with almost any architectural style; may be mounted in continuous rows.

A one-piece molded plastic shield is said to give excellent light and color transmission; can be removed without tools. Made of 20-gage cold rolled steel, knockouts are provided for either pendant or surface mounting. End tear-outs for continuous row mounting make a continuous wireway the length of the installation.

The fixture is finished in Miracoat, a high temperature baked enamel. Reflectivity is said to be not less than 86%. It bears the ETL label.

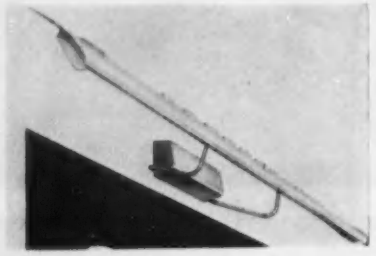
Fill in Coupon, Page 56

Floodlight

(26) General Electric Co., Lighting and Rectifier Department, Schenectady 5, N. Y.

Of rugged aluminum construction, the L-66 floodlight was designed for work and recreational activities in home, farm and industrial areas, its manufacturer states. It has a ribbed trunnion bracket that permits 360° vertical or horizontal rotation; uses a 200-w general-service lamp that throws a 946-cp beam.

This light weighs 4 lb. It has a large aluminum base suitable for portable use or permanent mounting; comes with a 6-ft neoprene-jacketed cord and molded plug. Knockouts in base permit mounting on 3¼- and 4-in. outlet boxes.



F Fixture

(27) Smithcraft Lighting Division, Chelsea 50, Mass.

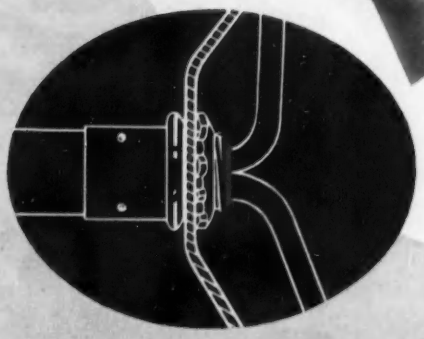
The Chalkboarder, a new fluorescent fixture for supplementary lighting of vertical surfaces, was designed for rapid-start bipin and slimline lamps. The reflector may be rotated for proper shielding and apertures in its top permit a soft uplighting to reduce contrast between the unit and the lighted area below. This fixture may be mounted individually or in continuous rows; is suggested by the manufacturer for schoolrooms, libraries, art galleries and for displays and bulletin boards, as well as for cornices, indirect lighting and wall desk lighting.

Red Throat

B-M 21 B, THE NEW INSULATED THROAT INDENTER CONNECTOR FOR E. M. T.

Four Ways Finer

1. Protruding rounded red plastic lip of bushing prevents cutting of insulation—eliminates shorts.
2. Full thread screws into all conduit fittings. Lip of RED THROAT bushing protects thread from damage.
3. Deep dished eight pronged lock nut is easier to drive on—screws flush to shoulder and digs into metal of box for vibration proof positive ground.
4. Permanent locked-in [illegible]ing insures smooth bu[illegible]raceway for easy fishi[illegible] extra work and costs n[illegible]



Briegel, the Original Indenter Fittings are neater in appearance, easier and faster to use. Installation is simple and less expensive. Two quick squeezes sets them forever. Try B-M Indenter Fittings and get more profits from each job!

ALL BRIEGEL FITTINGS ARE U. L. APPROVED AS CONCRETE-TIGHT

Order from Your Wholesaler!

All B-M Indenter Fittings are U.L. Approved as concrete-tight and for general use (File Card E10863). Also comply With Federal Specifications W-F-406.

UL

TELESCOPE BM SYSTEM

BRIEGEL METHOD TOOL CO.

GALVA • ILLINOIS

Warehouse Stocks in Principal Cities for Immediate Delivery!

SALES AGENTS FOR THE ELEVEN WESTERN STATES

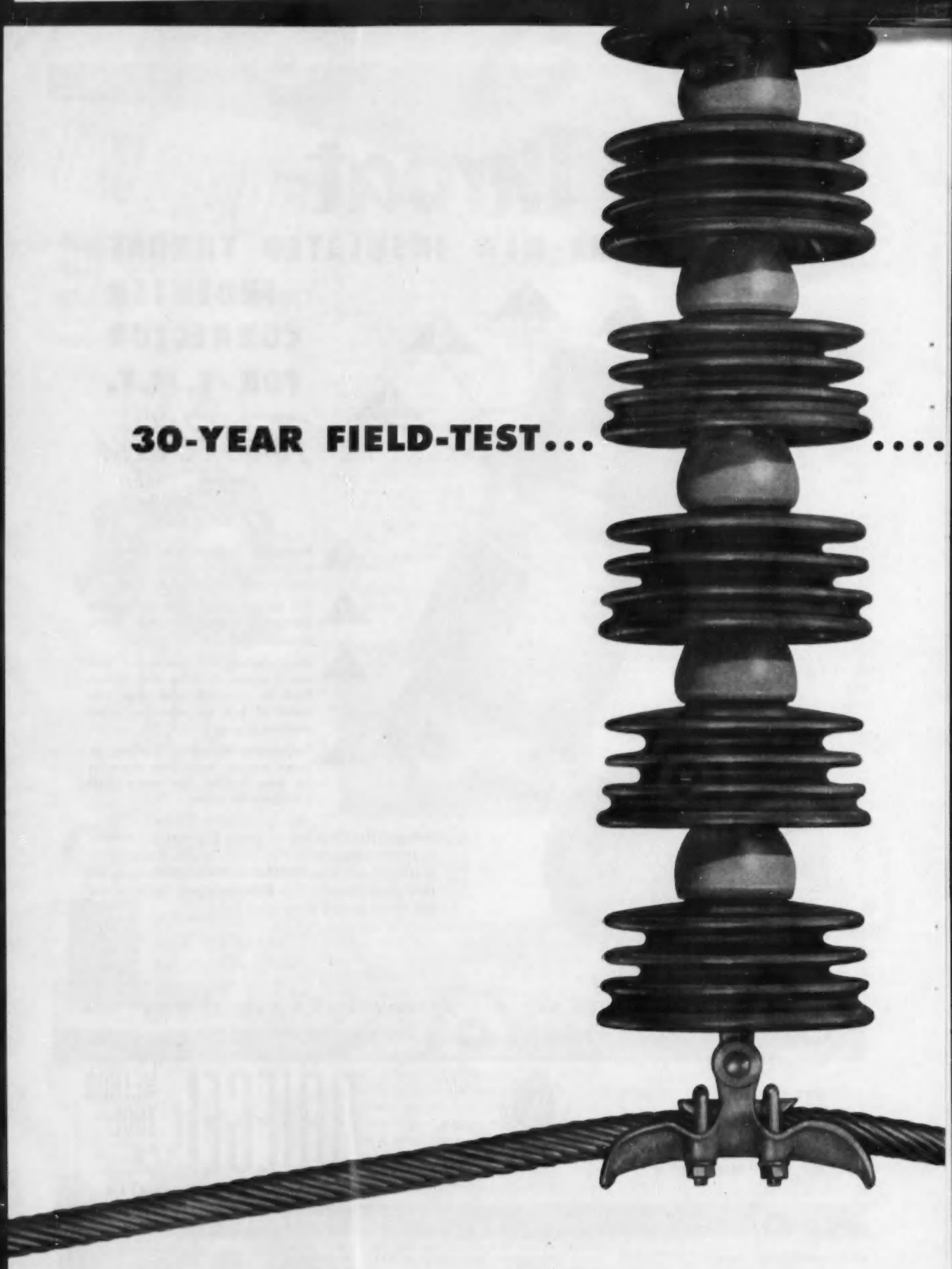
Gratiot-Hauch-Howard Associates
1282 Folsom Street
San Francisco 3, California

Rutkin Electrical Sales Co.
935 Standford Avenue
Los Angeles 21, California

L. D. Hood Sales
1133 West 8th Avenue
Denver, Colorado

W. W. Wheat & Son
2219—4th Avenue
Seattle 1, Washington

30-YEAR FIELD-TEST...



....PROVES LAPP FOG-TYPE DESIGN

In 1924, the Lapp Fog-Type suspension insulator was designed and first put into service. The design has remained virtually unchanged for the 30 years. It is the "standard" for successful performance in dirt conditions—every "fog-type" insulator which has ever won acceptance or achieved continuity of production has been based on the same principle of multiple short petticoats providing *exposed* leakage path.

Successful application of this design principle for contamination problems has been by no means limited to suspension discs. It is a primary design consideration of the Lapp Line Post and Station Post insulators—and one basic reason for the superior operating performance of these units for line and station duty. Such fog-type surfaces have become standard, too, for high-voltage bushings, which, with nearly all of their surfaces exposed, traditionally "get by" with shorter leakage distances than are required of switch and conductor insulators in the same stations.

There are, of course, sound reasons for the superiority of the *exposed* leakage path. In the first place, it provides a *uniform* leakage path, avoids concentrated hot-spots where local stress can precipitate flashover. Also, Lapp Fog-Type corrugations are self-cleaning. A maximum of the surface area is exposed to rain and wind which flush off contamination, to increase resistance and reduce leakage current.

For transmission duty in contaminated atmosphere, Lapp Fog-Types offer a *proved* record of operating security, long life and low upkeep.

Lapp Insulator Co., Inc., Le Roy, N. Y.

WESTERN REPRESENTATIVES:

Los Angeles: Earl S. Condon Co.
San Francisco: C. E. Ingalls & Sons
Seattle: Charles F. James
Butte: R. E. McDonough Co.
Salt Lake City: Riter Engineering Co.

Porcelain Products' wireholders *sell* because they're pace-setters. They're dependable—rugged . . . and packaged in a carton that is convenient to handle. It's practical—handy.

Porcelain Products' wireholders and secondary service materials have been known as *Quality Products* for years because of their strong, sturdy construction. Metal reinforced wireholders are designed with metal in tension, porcelain in compression—hot-dip galvanized steel parts. All wireholders have sharp, fast driving screw threads—large pulley-action wire holes —and many more features.

Porcelain Products' wireholders give you more value for your dollar—greater customer satisfaction. See your distributor.

ELECTRICAL PORCELAIN SINCE 1894

61 years

Porcelain Products, Inc.

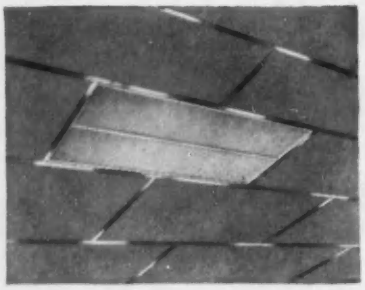
PP INC.

FINDLAY, OHIO

Infrared Brooder Lamp

(28) Westinghouse Electric Corp., Lamp Division, MacArthur Ave., Bloomfield, N. J.

A 250-w reflector-type infrared lamp for brooder and allied farm applications is said to provide more uniform distribution of radiant heat energy. It is pointed out that the lamp widens the heat distribution pattern and makes it more uniform, decreasing the tendency of the brood to crowd together. Designated 250R40/3, the new lamp is identical in appearance and dimensions with other infrared reflector lamps of the same rating; has an average rated life in excess of 5,000 hours.



Recessed Troffers

(29) The Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3, Mo.

Trend to large area lighting and use of grid ceilings has led to the development by this manufacturer of 24-in.-wide troffers. The new dimensions, 2x2, 2x4 and 2x8 ft, cover a line of recessed troffers with concealed hinged shielding. Units are available for two, three, four and six lamps, 20-, 40- or 75-w operation. The 2x4-ft units may be installed as individual units, in continuous rows or in patterns. They are fabricated of bonderized steel, finished in 300° white enamel and equipped with CBM and UL listed accessories.

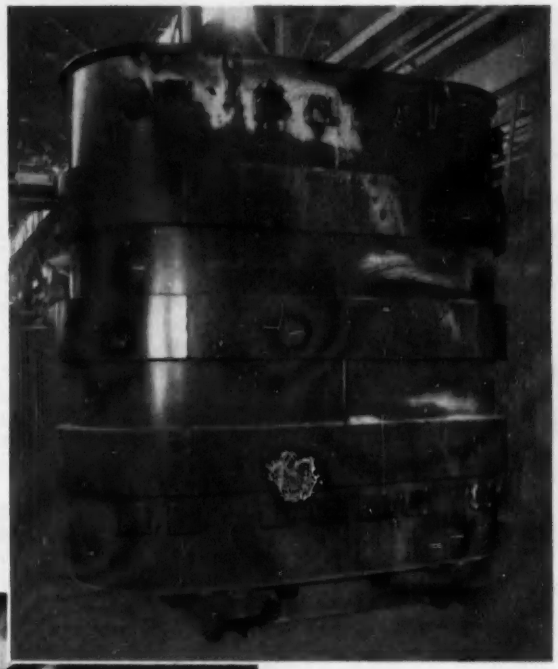
Lighting

(30) F. W. Wakefield Brass Co., Vermilion, Ohio.

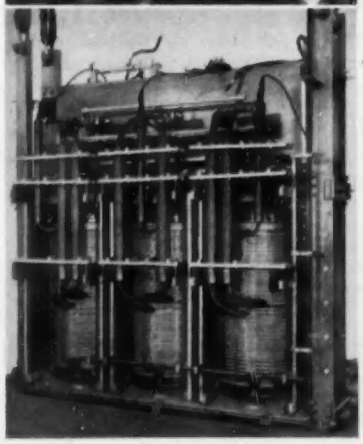
Omega-Plex is an addition to the manufacturer's Geometrics series and is a complete unit ready for on-surface mounting. Ballasts and lampholders are in an individual metal housing that provides hook-on suspension points for the Rigid-Arch diffuser. It has a non-specular matt finish to minimize possible reflected glare from outside the building. The unit is available also with louvers.

Omega-Plex comes in 2x2, 2x4, 1x4 and 4x4 ft sizes.

We don't like Accidents,



● Transformer tank withstood accident without damage.



● Inspecting engineer points out damaged base member.

● Electrical tests showed that no damage was done to the core and coils.

but, look what an accident showed us about our design

When the bridge is too low and the transformer traveling toward it is too tall, something is bound to happen when the two meet. And something did happen!

A depressed center car, carrying a Pennsylvania 7500 Kva Load Ratio Control Transformer, was switched from one track to another and coupled to the wrong train. Then it met up with the concrete bridge! After the dust cleared away, the transformer and car were found turned over on their sides.

When returned to our shop, the transformer was thoroughly inspected. Electrical tests showed that no damage had been done to the core and coils. Damage inside the transformer was negligible — a broken bushing lead and a few cracks in some wooden supports. *That's all!* The internal damage was slight *because* the core-and-coil assembly was rigidly supported and held by the core clamping frames — even when the transformer fell over on its side.

Externally, the load ratio control compartment was distorted, but the controls were undamaged. Two mounting panels of the underload tap changing switch were cracked. The front of the switching compartment was distorted, as was the nitrogen cabinet. Some of the transformer base members were bent and cut, and the portion of the cover that hit the bridge was dented.

That was the sum total of the damage. Repairs were made and complete electrical tests showed the transformer to be in excellent operating condition. It was shipped back to its destination and this time it stayed on the right track.

We believe the negligible damage that resulted from this accident is substantial proof of the extra mechanical strength built into all Pennsylvania Power Transformers.

PENNSYLVANIA TRANSFORMER COMPANY
A McGraw Electric Company Division, **CANONSBURG, PENNSYLVANIA**
Greater Pittsburgh District

ELECTRIC SYSTEM OPERATION

Just Published!

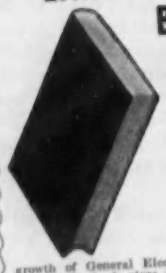
Describes in detail the operation of generating, transmitting, and distributing equipment, covering the major problems in running an electric system safely and economically. Reviews electric utility system from fuel input and water flow to customer's connections. Shows operations involved in scheduling and maintaining equipment. **Prepared by specialists under editorship of B. G. A. Skrotzki, Assoc. Ed., POWER, 370 pp., 276 illus., $6.50.**

ELECTRIC TRANSMISSION and DISTRIBUTION

Just Published!

Describes simply and clearly the equipment used in transmission and distribution of electric energy from generating station to consumer, including overhead and underground circuits, high and low voltage circuits, protection against short circuits, and lightning, and street lighting. Explains actual layout of equipment and what it does in the system. **Prepared by specialists under editorship of B. G. A. Skrotzki, Assoc. Ed., POWER, 448 pp. 291 illus., $7.50.**

LAMPS FOR A BRIGHTER AMERICA



A History of the General Electric Lamp Business

Just Published!

Tells the story of the miracle of modern lighting in a history of the G. E. lamp business. Closely following the growth of General Electric, along with the industry, the book gives a picture of the scientists and of the progressive research, technical achievement, and management efforts that **contributed to the development of today's high standards of lighting. By P. Keating, 246 pp., 40 illus., $4.00.**

SEE THESE BOOKS 10 DAYS FREE

McGraw-Hill Book Co., Dept. WEST-1
330 W. 42nd, N.Y.C. 36

Send me book(s) checked below for 10 days' examination on approval. In 10 days I will remit for book(s) I keep, plus few cents for delivery, and return unwanted book(s) postpaid. (We pay for delivery if you remit with this coupon—same return privilege.)

☐ Skrotzki—Elec. System Operation—$6.50
☐ Skrotzki—Elec. Transmission & Distribution—$7.50
☐ Keating—Lamps for a Brighter America—$4.00

(Print)
Name .....
Address .....
City ..... Zone... State.....
Company .....
Position .....

For price and terms outside U.S. write McGraw-Hill Int'l, N.Y.C. WEST-1

Socket

(31) Rodale Mfg. Co. Inc., Emmaus, Pa.

A built-in wing-type wrench to give greater leverage in handling has been incorporated into the design of the manufacturer's pin-type weatherproof socket. Each pin-type socket in the series is now designed so that the cap section is fashioned into the form of a wing-type finger wrench. Pressure applied to the wrench enables the interior contact pins to puncture through the insulating wire to make positive contact.

The socket also has a ⅛ in. longer screw and a deeper thread length in the cap. Listed as No. 234, it will take either No. 16 or 18 stranded wire and has an intermediate base. Rating is 75 w, 250 v. Each of these sockets is weatherproof and can be used both indoors and outdoors. A wire suspension hook is supplied with each for quick adaptability to any type of installation.

Adapter

(32) Harvey Hubbell Inc., Bridgeport, Conn.

Said to be extremely rugged, this three-wire composition grounding-type adapter was designed to adapt standard two-wire convenience outlets for use with new three-wire grounding caps.

This heavy-duty device is claimed to withstand the most punishing treatment without cracking, chipping or breaking, largely because of the composition material used for the body. Other features listed are parallel polarized slots and U-shaped grounding slot; parallel polarized blades, one narrow and one wide; hook-type terminal for easy connecting to ground; green 3-in. thermoplastic lead and double-sided contacts.

Designated No. 5273-L (with lead) and rated at 15 amp, 125 v, the adapter meets UL specifications and is designed to ASA standards.

(33) INSULATING TAPE—Availability of Bi-Seal self-bonding insulating tape in seven colors has been announced by Bishop Mfg. Corp., 46 Factory St., Cedar Grove, New Jersey.

400-Amp Circuit Breaker

(34) I-T-E Circuit Breaker Co., 19th and Hamilton St., Philadelphia, Pa.

This 400-amp frame molded case circuit breaker is said to be the first of that frame size to be built; is designed to bridge the gap between the 225- and 600-amp models.

More than one-third smaller than the 600-amp frame breaker, the new KL is 9 in. wide, 15½ in. high and 5½ in. deep, including handle. It is for use in panelboards, switchboards, motor controls, bus duct plugs and individual enclosures.

The unit is a thermal-magnetic circuit breaker with quick-make, quick-break operating mechanism. Interchangeable trip units provide continuous rating versatility from 125 to 400 amp. Common trip operation is retained and an overcurrent on any pole kicks out all poles simultaneously.

D-C Braking Controller

(35) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

A new d-c braking controller no larger than a combination linestarter comes in two sizes of enclosure for standard induction motors from ¼ to 25 hp. It will provide braking torques of as much as eight times full load running torque.

Operated from a single start-stop push button, it requires no adjustment after initial installation, the manufacturer states. Its main components are a selenium rectifier, contactors, transformer and timing circuit.

(36) CLAMPS—Ground clamps in three sizes — ½ in., ⅝ in. and ¾ in. — are designed to give high-pressure contact in a variety of standard applications; are cataloged GC type ground clamp for parallel cable connection to rod or pipe. Bodies are made of cast bronze alloy and square head bolts are silicon bronze. Made by Anderson Brass Works Inc., Birmingham, Ala.

Operation "Brain Center"

This room is the control, nerve, or "brain center" of the modern public utility system. From this room control cables carry impulses that operate switches, remote control devices, and telemetering equipment. Here men, by means of remotely-controlled switches, set up and break down circuits. It is here that failures of equipment and outages caused by the elements are circumvented.

All of these operations depend upon the sure and dependable performance of Simplex Control Cables. They must be ready to operate under every conceivable kind of condition. These control cables bear a measure of responsibility entirely out of proportion to their size. But they do it with absolute dependability. The safety of many millions of dollars of public utility equipment rests upon these slender cables and the equipment they control.

Simplex Control Cables are made in three styles: Anhydrex-insulated and neoprene-jacketed, Polyethylene-insulated and Plastex-jacketed, and Plastex-insulated and Plastex-jacketed. There is a size and a style to meet every operating condition on your public utility system, whether it be to operate equipment at a distance, for telephone and communication circuits, for telemetering devices. Whatever the need, be sure that the vital connecting link between the "brain" and the equipment is Simplex Control Cable.

Your local Simplex representative will be glad to help you with any problem you may be facing which has to do with cables.

Simplex Control Cables

products of

SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Mass.

TOP OF THE LINE

DEPENDABLE, LIGHTWEIGHT, LIFETIME

ANDERSON *Aluminum* CONNECTORS

TYPE LC-81A

A TROUBLE-FREE COMBINATION . . LC-81A AND DE-101 . . . WITH ALL THE "BUGS" ENGINEERED OUT! DESIGNED FOR EASY HANDLING AND QUICK, POSITIVE INSTALLATION!

TYPE DE-101

ANDERSON connectors, clamps, fittings and accessories are designed and engineered for strength, durability and high efficiency. ABW products are recognized standards in the industry.

ANDERSON makes "top of the line" handling of power connectors, clamps, fittings and accessories *fumble-proof*, too! Usually, just one wrench is the only tool a lineman will need.

ABW DESIGN MEANS QUALITY *plus* STRENGTH in the RIGHT PLACES

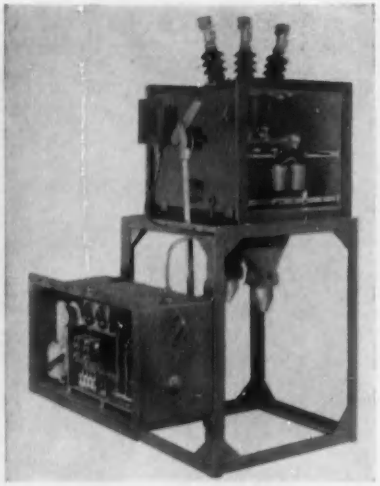
Consult one of our nearest 20 representatives or contact our main office.

ABW

ANDERSON BRASS WORKS, INC.

P. O. DRAWER 2151 • BIRMINGHAM 1, ALABAMA

Aluminum & Bronze POWER CONNECTORS • CLAMPS • FITTINGS • ACCESSORIES for SUBSTATION • TRANSMISSION • DISTRIBUTION SYSTEMS *for over a Quarter Century*



Automatic Mechanism

(37) G&W Electric Specialty Co., 7780 Dante Ave., Chicago 19, Ill.

This new automatic transfer mechanism was developed for use with oil switches, either double-throw or two single-throw units, to supply load from either of two feeders.

The mechanism automatically transfers the load from preferred to emergency feeder when preferred feeder voltage fails. It throws back automatically when preferred feeder voltage is restored.

With circuit F3A the load is held on the emergency (after throwover) until a push button is manually operated. With circuit F3B, for use with diesel motor generator as the emergency, throwover is delayed until diesel is started automatically and generator has built up voltage. With circuit F3C, with current transformers and latching relays, throwover is blocked in case of short circuit on the load side. With circuit F6 either feeder may be selected as the preferred by manually operating a remote selector control switch.

The model F mechanism is a watertight sealed housing. The mechanism unit is mounted on the steel supporting frame of the manufacturer's type RA oil switches in 5,000-, 7,500- and 15,000-v ratings. The mechanical and electrical details are given in bulletin DA-F.

(38) **TESTER**—A device for determining the direction of rotation of electric motors before they are connected to the line and the phase rotation or sequence of energized power circuits is offered by James G. Biddle Co., 1316 Arch St., Philadelphia 7, Pa. It can be used also to determine the polarity of power and instrument transformers and as a continuity tester in checking electrical circuits. It weighs 10 lb and comes with three line and three motor leads that are stored in the compartments on either side of the instrument panel. Bulletin 80-11 gives details.

America's Finest Suspensions...

THANKS TO VICTOR "KNOW-HOW"

and Purified Porcelain!

VICTOR No. 900
SUSPENSION

SPECIFICATIONS

Type.....ball socket	Leakage Distance.....11½"
60 cycle Dry Flashover.....80 KV	M and E Strength.....15,000 lbs.
60 cycle Wet Flashover.....50 KV	Impact Rating.....55 lbs.
Pos. Impulse Flashover*.....125 KV	RNI.....50 Microvolts
Neg. Impulse Flashover*.....130 KV	1000 KC at applied.....10 KV
Dry Arcing Distance.....7¾"	

*Crest KV. 1½ x 40 microsecond wave Critical Value

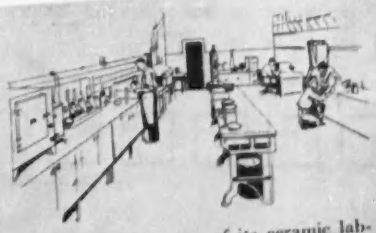
Every VICTOR Suspension insulator is the result of sound design, superior craftsmanship and VICTOR *Purified* Porcelain—finest insulator porcelain ever made! That's why they have improved thermal resistance, better mechanical and electrical characteristics and greater resistance to impact. Thanks to VICTOR's unique "know-how," you just can't buy a better suspension!

For the full facts on Victor "Know-how," write for "The Story of Victor and Purified Porcelain." For engineering data on all Victor insulators, write for Bulletin No. 4.

FEATURES

1. Higher mechanical strength
2. Greater resistance to thermal variations
3. Unequalled uniformity of mechanical and electrical values
4. Unequalled resistance to impact
5. Specially compounded cement for maximum strength
6. Caps and pins scientifically designed to withstand pull far above NEMA specifications
7. All metal parts hot-dipped galvanized for maximum resistance to weathering and corrosion
8. Special "cushion" coatings at all joining surfaces

NEWS FROM VICTOR



Victor has more than doubled the area of its ceramic laboratory. The enlarged laboratory affords Victor better, more modern facilities for testing raw materials, controlling quality of production and carrying on basic ceramic research. It was made necessary by Victor's expanding research program now under way.

SPECIFY VICTOR

Purified Porcelain Suspensions!

VICTOR INSULATORS, INC., VICTOR, N. Y.
SUBSIDIARY OF I-T-E CIRCUIT BREAKER CO.

Low and High Voltage Pintypes • Suspensions • Guy Strains
Spools • Switch and Bus Insulators • Custom Designed Porcelain
Insulator Hardware

Pat. Pend.

*KLEIN KUT PLIERS

for both regular and heavy-duty cutting

It was Klein that produced the first and still the finest regular side-cutting plier. Klein also gave the industry the modern, streamlined version so much in demand.

And it's Klein again with a new, high leverage cutting plier for light- or heavy-gauge wire, including No. 2 weatherproof hard drawn solid copper wire, and A.C.S.R.

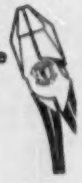
There's no extra hinging of any kind—no uncomfortable wide-spread handles—with this new Klein-Kut Plier. The offset hinge permits the extra-high leverage and operation is as smooth and easy as with any other Klein Plier. Forged from high-grade tool steel, individually fitted, tempered, adjusted and tested. Ask for No. 213-9 N.E. for streamlined pattern.

Regular pattern available

Same high-leverage design, but in the original Klein side-cutting pattern. Ask for No. 213-9.

Write for free Copy of Bulletin 1054

*Trade Mark



ASK YOUR SUPPLIER

Foreign Distributor: International Standard Electric Corp., New York.

"Since 1857"

Mathias KLEIN & Sons

BULLETINS ETC.

(39) SURFACE CONDENSERS—A new 20-page booklet released by Allis-Chalmers Mfg. Co., 939 S. 70th St., Milwaukee, Wis., deals with the proportioning of surface condensing equipment. It tells how surface condensers operate, gives nomenclature and definitions. It describes factors entering into the proportioning and selection of surface condensers, provides formulas for use in calculating performance of a given condenser and includes curves and tables.

(40) DERRICKS—A four-page folder showing its hydraulic pole handling derricks is offered by American Truck Equipment Co., Swan Island, Portland, Ore. Included is the new model HT with adjustable, telescoping side legs.

(41) CONNECTORS—Buchanan Electrical Products Corp., Hillside, N. J., is offering an illustrated pocket-sized booklet showing applications of its pres-Sure connectors.

(42) TOOLS—Electricians tools are described in a new eight-page bulletin prepared by Burbank Electric Products, P. O. Box 7, Burbank, Calif.

(43) WIRES—Wires and cables for the radio, electronic and TV industries are described in a folder from Chester Cable Corp., Chester, N. Y.

(44) CONNECTOR—An improved connector for liquid-tight conduit is described in a four-page pamphlet offered by Pyle-National Co., 1334 N. Kostner Ave., Chicago 51, Ill. It is designated bulletin No. 612.

(45) POLES—Information on pressure-treated Douglas fir is contained in a 12-page booklet prepared by Pope & Talbot Inc., Wood Preserving Department, 3070 N. W. Front Ave., Portland 10, Ore. It may be secured by addressing Paul D. Christerson.

(46) WIRE AND CABLE—Ettco Wire & Cable Corp., 46-50 Metropolitan Ave., Brooklyn 37, N. Y., has published a 24-page illustrated catalog of its wire, cable and metal conduit. It gives complete specifications and in addition includes NE Code requirements and statistical tables.

(47) FITTINGS—A 40-page catalog has been released by Jasper Blackburn Corp., 35 Madison St., St. Louis 6, Mo. It is divided into six sections—copper-to-copper fittings; copper-to-aluminum fittings; aluminum-to-aluminum; ground rods and accessories; terminal lugs; hoists and miscellaneous. Each section is thumb tabbed. Descriptive material and prices for each fitting are printed on a single page for convenience of users.

(48) WIRE CATALOG—A convenient pocket-size edition of its magnet wire catalog has been issued by Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y. The new C-79-12A contains all the information of the larger C-79-12 catalog and is completely indexed. It may be secured from E. Luna, Anaconda director of sales promotion, by writing on company letterhead.

(49) BOOM—A bulletin on the Hydro Sky-Worker made by Tay Mfg. Corp. of Milford, Conn., is offered by the distributor Maxwell Equipment Co., Ford St., Milford, Conn. This unit is a hydraulically operated boom for carrying workers aloft and keeping them on a work base at the required level.

KILL TWO BIRDS WITH ONE STONE—Fill out this coupon and get back valuable information from as many sources as you indicate.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after March 1

Please send me, without obligation, the new product information or catalogs:

If described in Product News, circle item number

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49

If described in advertising, fill in page number

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

NAME..... TITLE.....

COMPANY.....

ADDRESS.....

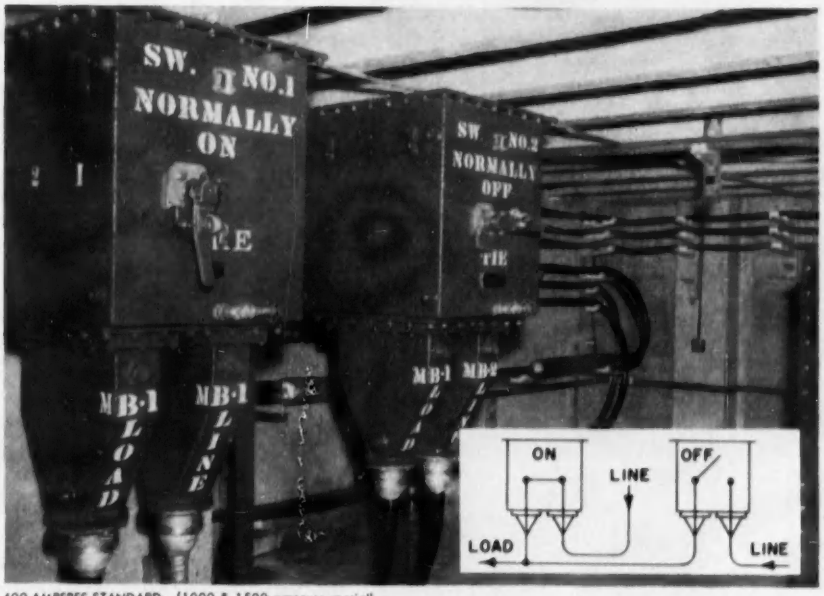
CITY..... ZONE..... STATE.....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

G&W type "RA"

Load Break Oil Switches

provide safe sectionalization for cable system flexibility



400 AMPERES STANDARD—(1000 & 1500 amperes special)
STANDARD VOLTAGES—600, 7,500, 15,000, 23,000 (illustrated), 34,500

TYPE "RA" SWITCHES PROVIDE FLEXIBILITY—With "RA" switches located at strategic points in cable circuits to provide flexibility, a system can be so arranged that important loads will have an alternate source of power immediately available.

TYPE "RA" SWITCHES ARE SUBMERSION PROOF—Since their introduction in 1928, Type "RA" switches have had a trouble-free operating record which fully justifies their use as load break disconnects for single or multiple circuits. They are safe and reliable, combining simplicity with economy in construction, installation, and maintenance. They will operate properly after long periods of inactivity to provide fast and convenient isolation of cable sections in case of trouble and to permit rapid re-routing of circuits to materially reduce losses normally incurred through electric service interruptions. Exposure to weather extremes or complete submersion for prolonged periods will not affect prompt and safe operation when necessary. They are water, oil, and air-tight.

Send for Bulletin DB51 which gives dimensions and prices on various styles of 2, 3, and 4 way "RA" switches.

50th ANNIVERSARY G&W 1905-1955

G&W ELECTRIC SPECIALTY CO.
7780 Dante Avenue, Chicago 19, Illinois

Representatives in principal cities of U.S.A.
In Canada—Powerlite Devices, Ltd., Toronto, Montreal & Vancouver

G&W

D547A

ELECTRA'S HUSBAND

Why Husbands Read Business Papers

"WILL the time ever come when you'll stop bringing home a big pile of magazines to stick your nose into every night in the week?" Electra asked one night recently with considerable irritation. "You don't have time to talk to me; we don't go out any place; and I can't, like you, read with the radio playing."

"If I ever retire I may stop reading some of these business magazines," I conceded tactfully. "But until the pressure of earning both a satisfying livelihood and some degree of financial security for both of us is off, I expect to continue to read a lot of business papers. Anyway it isn't every night; it's only about one night a week. As for the radio, if you want to read, I'll turn the damned thing off."

"Well I still don't understand why you have to do it," she said resentfully. "I don't know any other husbands who bring their work home with them."

"Oh yes you do, dear lady," I retorted. "Just the other night I heard you and Charlotte talking about the reading that both your husbands did at night."

"He's the exception," she muttered truculently.

"No he is not," I protested. "As a matter of fact there are millions of men throughout the country that read their business magazines at home. They may not read as many as I do, but they read two or three.

"And why not," I ventured as I warmed up to the subject. "You women read your business papers at home."

"Now wait a minute," Electra interrupted. "I don't read any business papers unless you put the *California Farmer* in that category."

"What do you call *Vogue* and *McCall's* and *Sunset* and *House Beautiful* and *Good Housekeeping* if they're not business papers," I argued. "Your business is keeping yourself attractive so you can hold onto your husband or get another if anything happens to me and in maintaining the kind of a home that will make both of us happy, comfortable and contented and at the same time register the right impression on our friends. So you read about hair styles and fashions in clothes and ideas in interior decorating and menus for keeping me thin and new recipes in the magazines I mentioned. And at the same time you read the ads that tell about all of the new things aimed at making you and other women more attractive and alluring and at the same time telling you what to buy to cut down on the amount of time, work and energy necessary to do the homemaking job."

"Maybe you are right," she mused. "I had never thought of it that way. But I don't like the implied sarcasm in that business of keeping attractive so you'll appreciate me. I can get all of the men I want just as I am."

"Sure, sure," I agreed quickly. "You can just so long as I make enough money to give you the proper setting. That's one reason why I and countless thousands of other husbands read millions of copies of business magazines every week and every month. The competition of keeping constantly abreast of our jobs and the pressures of a complex, dynamic and fast-moving business and industrial economy forces us to do it.

"Men who hold key positions in industry or men who are striving to win such jobs get ahead and keep ahead in business because they possess know-how. Industries rise because research, engineering and production know-how develops new products, new techniques and whole new areas of business. Our economy grows on know-how. You women thrive on know-how.

"Most of this know-how can't be found in books because we develop new knowledge at an incredible pace. Books can't keep up with it. Ours is a live, growing, changing know-how that moves ahead with research, grows with every rough problem licked in a factory and every new sales angle developed by an able merchandiser in the most remote part of the country.

"It's fortunate that in America we have an active, informed and continuously informing business press that strikes every part of our economy and distributes new knowledge as fast as it sprouts. The toughest problems are shared, their solutions are analyzed and interpreted in the pages of specialized magazines serving all areas of business, industry and the professions.

"It's just like you and your job—there are magazines that touch every facet of it, from clothes and cooking to how to raise babies."

"But we never had any babies," Electra observed dryly.

"What do you call eight nieces and nephews and five or six godchildren — monkeys?" I commented caustically. "We've practically raised some of them."

"I wasn't being critical," she explained. "Go ahead with your discourse."

"Well as I was saying before you interrupted me, a man or a woman in business or industry can't get by any more on what they learn in school and college," I continued. "There is something new to learn every month—almost every day. Anyone who stops searching out knowledge from the printed page can't design today's products, manage today's businesses, work in today's research laboratories or run today's production lines. To hold their own—to say nothing of moving ahead — men must know more than the growing and changing techniques of their own trades. They must keep up with changing times, fluctuating markets, the uncertain moods of the public, the interrelations of costs and government regulations and public demand and finally, the temper and designs of labor unions.

"All of this and a whole lot more good business papers give to men in business and industry as general news of their own specific fields along with the specialized know-how of their jobs. Business magazines are among our greatest educational forces.

"Today almost everybody of any stature at all learns from his business papers because he must."

"Do you know something?" Electra proposed. "You go back to reading yours. And if you'll turn off that musical background, I'll read mine. But it may cost you money. I saw a new suit in the last issue of *Vogue*."

What to Do When LOADS GROW

Use a Vault-Type Power Unit to Replace 3 or 4 Separate Distribution Transformers On Pole or Platform

New vault-type power unit saves space, is exceptionally easy to install, reduces maintenance.

It combines three or four distribution core and coil assemblies in a single tank. Unit is so compact that it requires less than half the space needed for a conventional bank of three or four distribution transformers. Put it anywhere: the tank is completely welded and the unit can be operated continuously in locations which may become flooded. Find a spot inside — as was done in the installation shown at right — you can locate it in any corner.

Factory Assembly Simplifies Installation

Units consist of either three or four distribution transformer core and coil assemblies to supply three-phase power or three-phase power and single-phase lighting loads. Metering connections are simplified by mounting current transformers in the case. Potential transformers can also be mounted internally if desired. Assemblies are internally connected at the factory and leads are terminated at the cover. There is no primary or secondary bus work to be done at the point of installation. If a three-assembly unit is desired for present needs, room can be left for a fourth assembly to be added at a later date when requirements increase.

A-4499

500-Kva, Three-Phase Vault-Type Power Unit

The Allis-Chalmers vault-type power unit is the ideal answer to space or load growth problems for schools, hospitals, hotels, large apartment houses, shopping centers — anywhere loads grow fast. Get complete information from your nearby A-C office or write Allis-Chalmers, Milwaukee 1, Wis., for all the facts.

ALLIS-CHALMERS

RAPID CALCULATIONS by one of Card Programmed Calculators used by G.E. for turbine and power transformer designs are reviewed by Analytical Engr. Ed Magnusson and Lynn Wetherill, Mgr. Engineering, Power Transformer Dept. "CPC", like electronic analog computer used for switchgear designs, is setting the stage for lower cost electrical apparatus.

Now—electronic computers reel off equipment designs to cut system costs

Engineers free for creative design as machines do tedious calculation

Substantial savings in engineering time and greatly increased selection of apparatus design possible through General Electric's use of electronic computers points the way to a reduction in power system dollars per kva of capacity. In some instances savings of as high as 97% in the design time of large equipment have been made through the use of card program calculators, effectively reducing costs and at the same time permitting many more design approaches to be investigated.

CONSERVE ENGINEERING TIME

Calculating machines are helping engineers determine the most suitable turbine, power transformer and switchgear designs for any system. Their use has in many cases slashed the 15 to 40 hours of computation time formerly required on elaborate calculations to a single hour. Whether applied to preliminary specifications or to detailed product designs, such savings point to ultimately lower cost power system equipment.

BETTER PRODUCTS FORECAST

In addition, the new computers permit engineers to consider an extended range of equipment and system designs without incurring the high costs associated with old style methods. And computations can now be completed with greater accuracy.

Developments such as the application of electronic computers to electrical apparatus designs can help electric utilities obtain most suitable and efficient systems possible. To take full advantage of their speed and accuracy, contact your Apparatus Sales Engineer early in your system planning. General Electric Company, Section 301-278, Schenectady 5, N. Y.

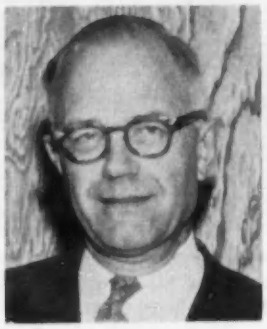
MORE POWER TO AMERICA

GENERAL ELECTRIC

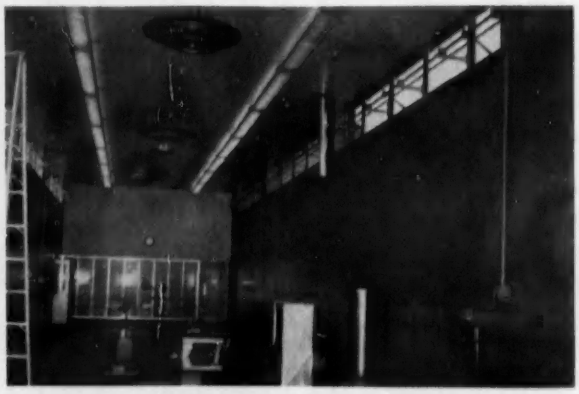
JANUARY 1955 Vol. 114, No. 1

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.



To HOWARD DODGE we dedicate, as a memorial to him, this pictorial account of the exceptional new Underwriters' Laboratories Inc. building at Santa Clara. Self-effacing and modest, he asked that his name be kept out of the story, saying that it was the result of the thoughts and ideas of all of the UL engineers. He was insistent, however, that Harold Gerber, consulting electrical engineer, former San Francisco chief electrical inspector, be given full credit for his ingenious design ideas and thorough planning. In truth both worked long hours with Austin Co. engineers, first to plan, then tie down in meticulous and rigid specifications, every single detail of materials and construction. It was Howard Dodge who prepared for the new project by a tour of the country's leading laboratories. It was he who stayed at the job site watching every bit of construction, quietly but firmly insisting on strict adherence to the specifications, allowing no substitutions for what had been carefully selected. His job completed, when Howard Dodge died, Nov. 20, he left a remarkable facility for the testing of electrical equipment made in the West as his contribution to the profession he upheld with such integrity



Electrical (left) and oil and gas (right) testing laboratories are provided extreme flexibility by wiring system that makes the . . .

West's New UL Ready for Region's Growth

Hardly a better reflection of the growth of electrical equipment manufacture in the West could be found than the newly completed and operating testing and office building of Underwriters' Laboratories Inc. at Santa Clara. It replaces a badly outgrown Western laboratory at 500 Sansome St., San Francisco, and is the third increase in size since the first laboratory for the West was started in 1923. While it is primarily built for electrical testing, space on the seven-acre plot is available for future construction of a fire testing laboratory if needed.

Here the products of electrical manufacture desiring the UL label or listing are brought for thorough examination and test according to the standards established by the National Electrical Code or Underwriters' Laboratories through its committees of industry members who advise and consult with the UL engineers. The Western laboratory tests such things as electric air heaters, household appliances, welders, television and radio sets, lighting fixtures, juke boxes, commercial appliances, meter sockets, switches and control devices, switchboards and panels, wiring devices, in fact almost any submitted.

The new building is a truly extraordinary piece of construction in every detail, so much so that space here can but touch on and illustrate four major electrical features, some found nowhere else. With rigid adherence to class A construction standards of the National Building Code, it should be the most positively fireproof building

Service corridor has a central utility trench on which floor cells open for distribution from switchboard on other edge facing transformers to anywhere in main testing laboratory at right

Trench for office machine power, signal and telephone in the floor runs from main utility trench along halls and across office area floor. Cells at right angles to trench take circuits where used

Switch and panel testing room backs on service corridor above where circuits run from switchboard into utility trench then into cells to steel channel shown here to test panel and platform

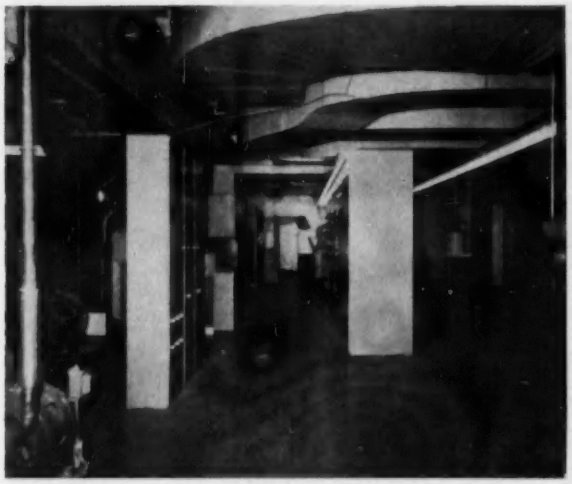
Installing special metal gutter along wall in insulated controlled temperature room. Note also steel channels vertically to which equipment for test can be clamped. Also steel construction of walls

in the West, embodying concrete, steel and three-hour fire resisting plaster throughout. Electrically the maximum of flexibility was incorporated.

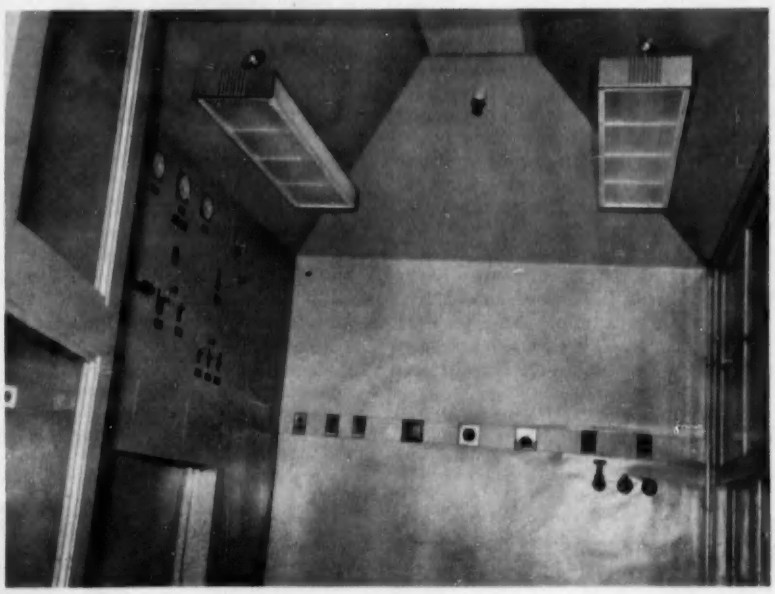
These four major features are: (1) An exceptionally versatile tapped transformer and tap changing panel by which to get a wide variety of voltages for testing purposes; (2) Extreme versatility of distribution to all parts of the building through trenches, cellular steel floors, a wall-inserted trough or gutter plus the switching necessary; (3) Special facilities for testing of oil and gas burning automatic controlled equipment, a wet room for testing water using equipment and for rain tightness, a controlled temperature room to simulate desert heat or arctic cold, a burn-out room to test to the point of burning out, a photographic darkroom and picture taking area, provision for a future "any purpose" room, and storage, crating and handling facilities; (4) Provision for expansion of the electrical troughing when the building is enlarged at some future time.

Electrical design, including the special transformer, was the work of Harold L. Gerber, electrical engineer, Coddington Co., consulting engineers, and the late Howard Dodge, senior electrical engineer of the San Francisco laboratory, and his associated engineers. It was worked into the building design in cooperation with Austin Co., engineers, who were general contractors. Roy M. Butcher Co., San Jose electrical contractors, made the installation with care and precision required of it. Primary is brought in at 4,160 v to main breakers in the central service corridor (on each side of which are the main testing laboratories). There are three transformers adjacent. First is a 300-kva, three-phase, 120/208 four-wire unit for house lighting, air conditioning, office equipment power and heating. There is also a 100-kva, 120/240-v, single-phase unit to provide single phase for testing purposes.

The special transformer is a 500-kva



Service corridor: special tap transformer facing switchboard where variety of testing voltages made possible by tap changing section



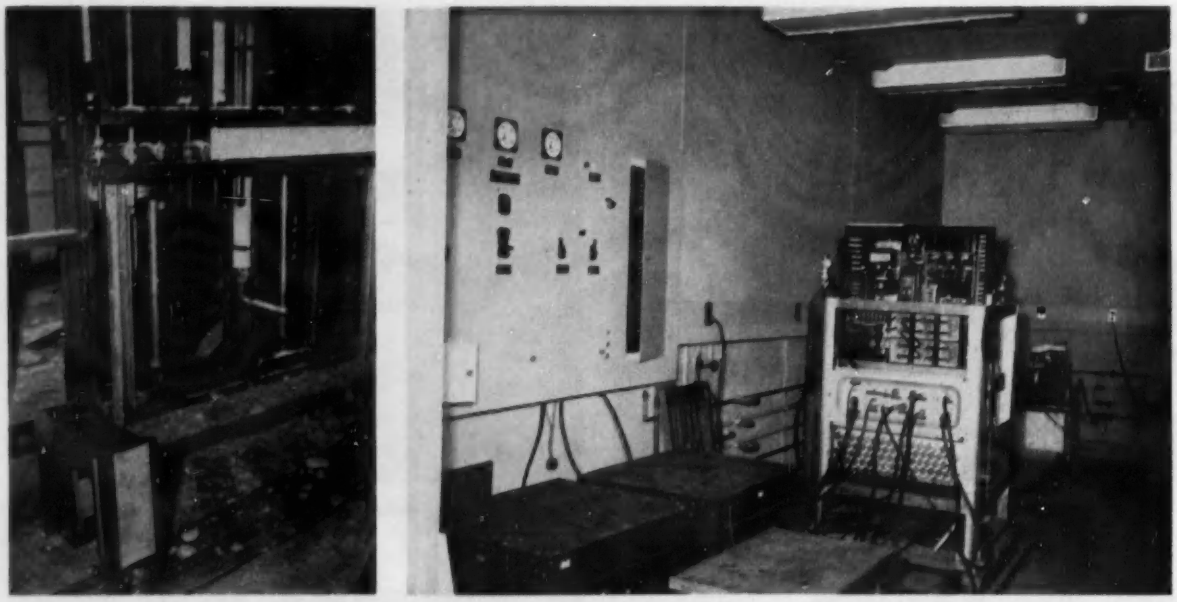
Switch and overcurrent test room now with panel and floor channel. Burn-out tests are made in this fireproof vented room well equipped

unit, 660-v full rating, with taps to provide voltages for testing. With these it is possible to provide 600, 575, 476, 465, 440, 244, 232, 220, and 208 v phase to phase. In addition phase-to-phase neutral connections can be made to provide additional voltages of 381, 347, 332, 275, 268, 254, 141, 134 and 127. To accommodate its 34 bushings with room for connections an enclosed cabinet was located on the side of the tank. Conductors from these go up into a trough, across the aisle to the top of the switchboard. Transformers are isolated on their own concrete pads to prevent noise transmission.

A tap changing section 10 ft wide in this main distribution board faces the transformer. In it there are three voltage section panels each related to a separate phase. Across the bottom are circuit breakers. Into this board also come five controlling feeders, from a 50-kw d-c generator set and the three-phase autotransformer and from the test panels in the burn-out room, wet room and switch testing area.

Voltage selection is done through two series of bus bars. A vertical series of 32 is connected at the top to the transformer. A horizontal series of 15 bars, five in each of three separate phase panels, is connected at the bottom to the five feeder breakers. The bus bars are segregated by ebony asbestos barriers. The bars are pierced where they are opposite each other. Into these drilled holes connector bolts with insulated handles can be inserted to connect between any stepped voltage level and any specific feeder breaker. The entire panel is dead-front.

The switchboard rests half on the concrete floor and the rear on piers in the central utility trench (18x35-in.). Conductors are brought down into this trench from the bottom of the board into a 16-gage galvanized steel channel supported clear of the trench con-



Wiring gutter and water, gas, air pipes to serve the wet room. As it looks now, test panel at left, pipes and gutter along the walls

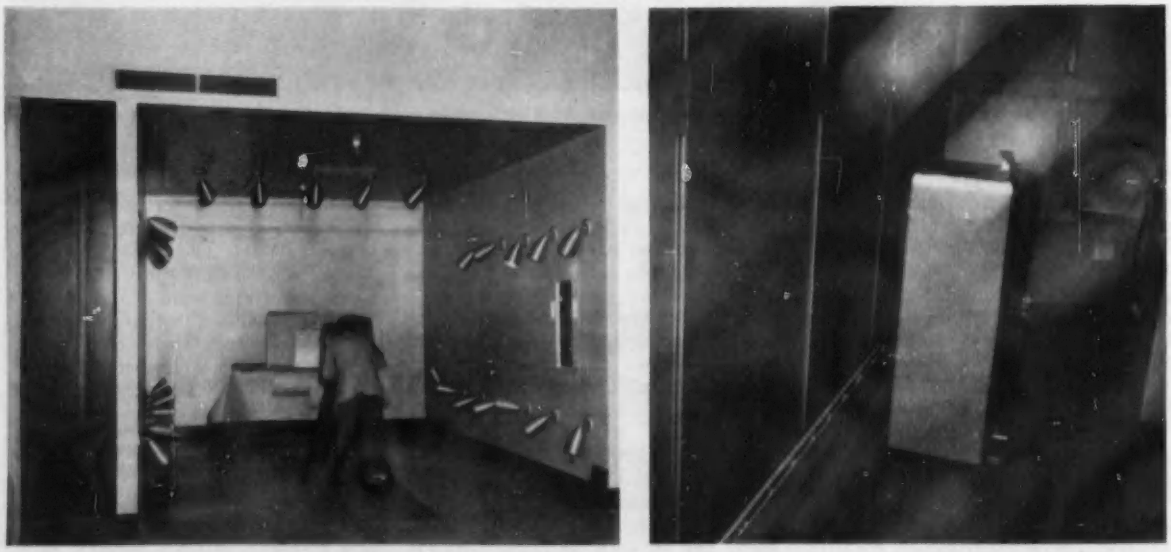
crete floor by angle iron framework. This also segregates the separate raceways for telephone and lighting, etc. The cellular steel floor from the test laboratory terminates at right angles to this trench and can be used to run circuits to any desired lateral.

Branch trenches of the same gage metal, with saddles on 2-ft centers, are 8x9 in. in cross section, with a barrier to separate the 120/208 for lighting and power from the signal and telephone circuits. Crossovers are provided to run across without disturbing the wiring beneath. These trenches run from the main trench down the office corridors and across the offices to take circuits wherever wanted through the abutting floor cells.

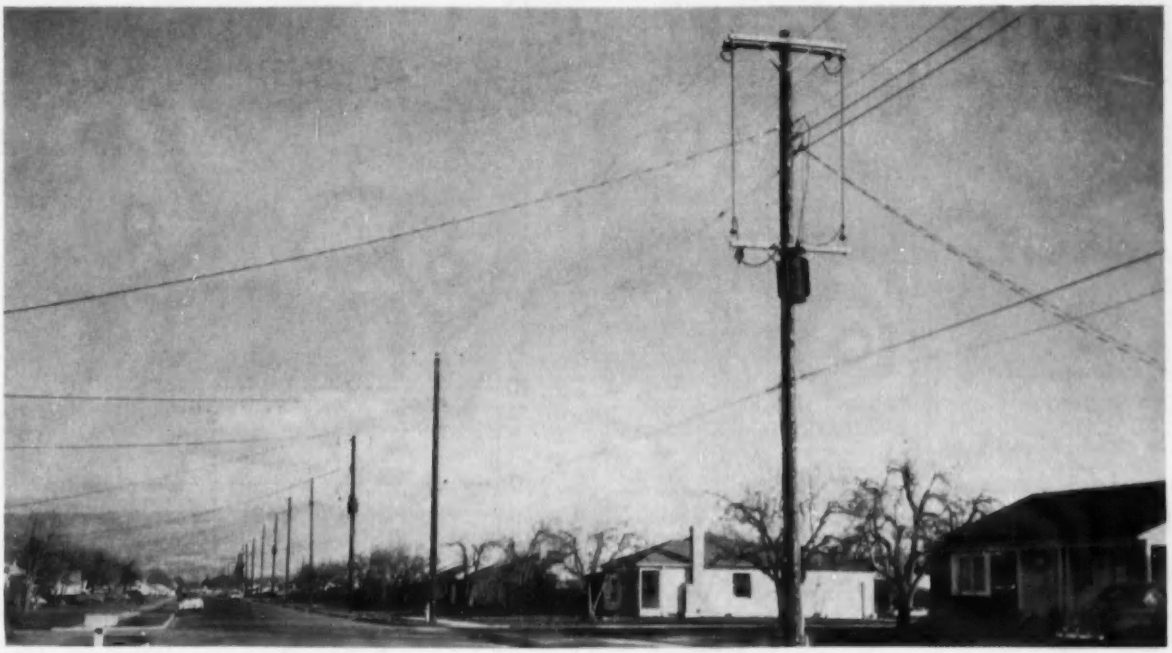
To give versatility to electricity supply to all of the laboratory areas a flush-mounted, 5 x 4½-in. steel raceway extends across complete wall sections, capped at the ends within 6 in. of doorways. These are connected to the floor raceways by conduit risers and all contain a No. 6 copper grounding wire at the rear on clamps, connected to the water system every 50 ft. Receptacles with individual cover plates can be inserted where wanted to provide 15-, 30-, 50-amp, 120-, 240-v a-c or 15- or 30- amp, 125- or 250-v d-c. Regulated power of from 85 to 155 v a-c is also supplied the test benches through the floor cells.

Both main utility trench and branch trenches have been extended, capped and filled with dry sand, beyond the present use area under the extensive storage and loading area at the rear to be used when needed for expansion.

Many more interesting details are well worth a visit to the new laboratory to see and appreciate.



Darkroom and photo room with adjustable lamps, curtain channel. Controlled temperature room has baseboard heater, wall racks



Fifty space heating customers in this 1,400-ft block are served by three 50-kva and one 100-kva transformer, or 5 kva per house

Space Heating Proves Desirable Load

House-heating customers return $1.70/kw of demand compared with $1.63/kw for nonheating customers on California Oregon Power Co. system

L. M. Stinson

Electrical Engineer
California Oregon Power Co.
Medford, Ore.

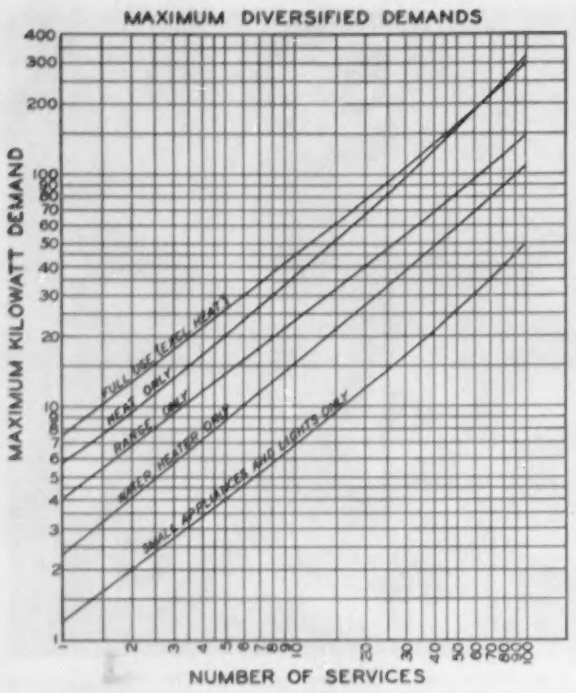
Desirability of electric house-heating load has been questioned by almost every utility in the Pacific Northwest since customers began demanding this type of service shortly following the war. The California Oregon Power Co. never promoted space heating nor on the other hand has the company opposed it. Enthusiasm on the part of dealers and customers, coupled with a mild climate (average of 4,547 degree days over a 20-year period), relative high cost of oil and gas, and a low block on the end of the residential rate have combined to bring about a saturation of 16.4% as of October 1954. The company serves 67,048 residential customers, of which 10,981 are heating customers.

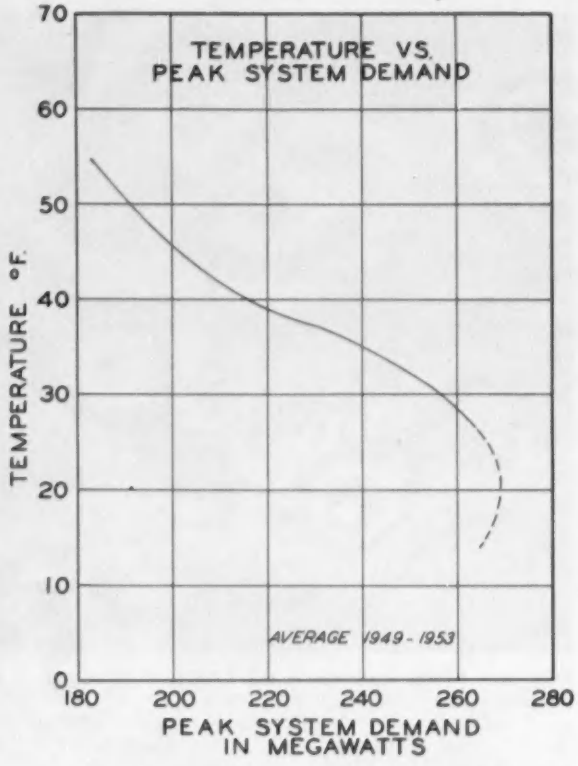
The data in the accompanying table are taken from 1953 billing statistics for the Oregon portion of the system. These will be used to develop a comparison between a residential customer with range and water heater, and the residential customer with range, water heating and space heating.

From these statistics it may be seen that the heating customers represent 22.2% of the total considered; that the heating customers used 39.7% of the total kilowatt-hours and provided 34.3% of the total revenue. Using the accompanying curve for maximum diversified demand from which to pick average peak demand for one residential customer, full use exclusive of heating, it will be found that the demand is 7.5 kw whereas for one residential customer with space heating the demand is 7.5 kw plus 5.7 kw for heating. Adding the two, it is found that the total demand for a customer with space heating is 13.2 kw. Using these values to find the average annual load factors for each case gives the following results: average annual load factor for the residential customer is 12.87%; whereas the customer with house heating had an average annual load factor of 17.73%. If the heating were to be considered by itself, the average annual load factor would be 24.12%. It should be noted that these load factors are based upon averages and, therefore, will run higher than some that have been reported.

It will be noted that the above statistics are for the calendar year of 1953. A check has been made on the first 10 months of 1954 and the data substantiates the 1953 results but were not used here since a complete calendar year is not yet available.

Another comparison between the heating customer and the nonheating customer is to take the average maximum demand for one customer of each class, as used for the average annual load factor calculation or 13.2 kw and 7.5 kw, respectively. By dividing the annual revenue by the demand it is found that the heating customer returns $1.70/kw of demand as compared with $1.63/kw for the nonheating customer. This does not indicate a high demand per dollar of revenue, as





Diversified demands are computed from curves above. Curve at right correlates system demand with the weather forecasts

some have claimed, for the heating customer.

With the rapid increase of heating loads on the Copco system and increased energy consumption, a definite need was felt for a curve that would show maximum diversified demands for various numbers of customers. The accompanying curve is used in planning transformer installations, secondary loading and primary loading. The curves were plotted after extensive tests had been made on the Copco system. This curve is based on averages. For that reason when using it one must judge the customers to the average. In the case of the Copco system, this means about 10 kw of heat installed per customer. In practical use this curve has proved to be reasonably accurate, as long as averages are used.

For more than four years a study has been underway to see if system load can be predicted from a temperature forecast. Not only is the utility faced with the problem of increased system load brought about by temperature affected load, but if temperature should drop low enough it would have a decided effect on plant output. An average curve has been plotted from four years' data as will be seen. To the right it will be observed that the curve turns downward slightly and that the dotted portion is hooked back to the left to indicate that if temperature should continue to drop it would finally result in a reduced system peak. This is based on the principle that during the lower temperature considerable industrial load such as sawmills would be shut down because of ponds freezing. Actually, during the years that these records have been kept the temperature has not fallen low enough to prove definitely the shape of this lower end of the curve.

With the increasing saturation of heating load, the system load factor has been watched closely. Winter peak in relation to summer load has definitely increased. This in itself is not detrimental to the Copco system since hydro plants are predominantly stream flow plants and consequently are generally able to meet the higher peaks. The increasing spread between summer and winter system peaks brings some concern. However, this can be remedied by two types of load

Saturation of Space Heating

Year	Number of Heating Customers Added Each Year	% Saturation of Heat Customers to Total Residential Customers
Prior to 1948	261	
1948	591	0.92
1949	964	2.42
1950	1,712	4.61
1951	1,968	7.64
1952	2,118	10.55
1953	1,739	14.50
1954 (10 months)	1,628	16.4
Total	10,981	
1957 (projected)		25.0

Comparison of Heating and Nonheating Residential Customers

	Nonheating	Heating
Yearly consumption for billing class	213,394,743 kwh	140,800,907 kwh
Average number of customers	25,242	7,220
Yearly revenue	$3,093,715.49	$1,617,317.31
Average yearly consumption/customer	8,454 kwh	20,500 kwh
Average yearly revenue/customer	$122.56	$224.01

Thermostatically controlled individual room heaters are widely used for space heating in the Medford area. Three popular types are, left to right: Electromode fan-type heater, Electroglas panel heater and flush-mounted Westinghouse heater. All are 2,000 w

in particular—summer irrigation and air conditioning. Sprinkler irrigation load is increasing and air conditioning is expected to come rapidly. Air conditioning load and space heating load complement each other so ideally that those utilities with appreciable air conditioning load are now planning space heating promotion to improve annual load factor. In the case of the Copco system the space heating load came first, therefore air conditioning is the load to be promoted.

Rate History

In 1945 there was a general rate reduction. Low block on the residential rate was eight mills. Rate increases in May 1953 and December 1953 affected heating rates. The low block is now 1.1c but this does not seem to have discouraged electric house heating. Revenue figures as previously given are for 1953 and, therefore, are lower than is expected for 1954.

Copco never has had a demand feature for space heating in its residential rates nor has it required peak limiting devices. Company policy has always been to supply the customer with any service he wants at the simplest compensatory rate. It is understood that several Northwest utilities who had demand charges for space heating are now abandoning this type of rate, feeling that additional cost of billing and adverse public relations offset any advantage of the demand charge.

Types of Installation

All popular means of utilizing electrical energy for space heating have been employed by Copco customers. Utilization equipment ranges from a few heat pumps to central furnaces, radiant heating, glass panels and thermostatically controlled individual room heaters. In general, the latter have the greatest diversity and give good customer satisfaction. A few typical space heating installations are shown in the photographs.

In addition to residential space heating, a large commercial space heating load is served also. Many motels on the Copco system use space heating. At the close of 1954 there was an estimated 2,500 kw of commercial space heating.

Distribution Practice

One of the accompanying photographs shows the distribution line on a street where each house has space heating. In this 1,400-ft block there are 50 houses served by three 50-kva transformers and one 100-kva transformer—250 kva or 5 kva per house. The three 50-kva transformers have one span each way of secondary with 1/0 hot legs and a No. 2 neutral. The 100-kva transformer has two spans of 2/0 secondary in each direction. Service wires are three No. 2 triplex aluminum. Primary voltage is 7.2/12 kv, Y.

In some areas secondary banking is employed, using type CPB transformers. The company plans to use Kearney automatic secondary breakers at mid points between transformers to permit banking of older-type transformers.

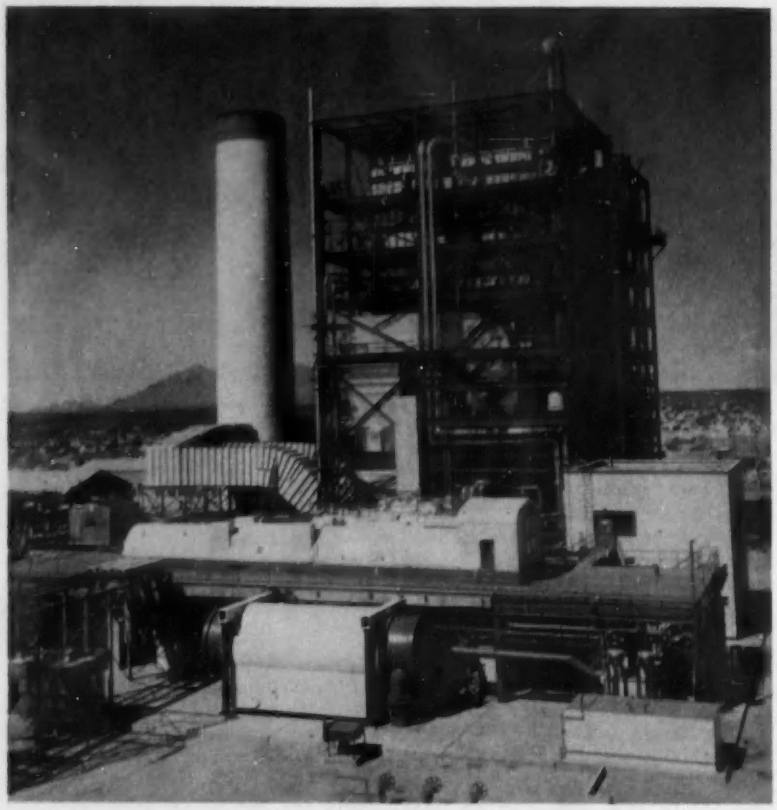
No matter what arrangement of transformers and secondaries is used, both are sized so that there is no flick voltage as heaters cycle on and off.

Conclusions

The California Oregon Power Co. does not claim to have all the answers on space heating but feels satisfied with the development so far. Further tests will be made, principally to determine the diversified demand for a larger number of space-heating customers. The curve previously referred to has been proved for up to 100 customers but its extension beyond that point, although believed to be conservative, cannot be substantiated from present data.

In common with many other utilities Copco feels that the answer to year-around air conditioning lies in the heat pump. Two Westinghouse air-to-air heat pumps are now being installed in employees' residences and complete operating data will be compiled.

Besides the popular Wesix heater there are many of these thermostatically controlled Wesix baseboard heaters being used. They spread low temperature heat over large area



Saguaro is 200-mva outdoor-type plant featuring extensive use of aluminum insulation

In Arizona's power system

Saguaro Is Key Plant

Walter T. Lucking
Arizona Public Service Co., Phoenix

Honoring Arizona's stately Saguaro cactus plant, Arizona Public Service Co. has named its newest steam-electric plant Saguaro station. First of two 100,000-kw units is now in operation at Saguaro, 30 miles north of Tucson and 90 miles south of Phoenix on transcontinental highway 84. A second similar unit is scheduled for April 30, 1955.

Saguaro plays an important role in the production and distribution of electric power in Arizona. This major addition to the state's electric resources was located, designed and built to benefit not only customers of Arizona Public Service but electric customers throughout most of the state. Marked economies were achieved in plant construction; further economies are being offered in the delivery of Saguaro power through transmission agreements with state and federal agencies. The objective — and the result — has been to assure a continued adequate supply of low-cost electrical energy for the fastest growing state in the nation.

Aluminum for Insulation

Features of the station include utilization of aluminum for piping and boiler duct work insulation, closed-circuit television for determining boiler water level, an operating force of four operators per shift and total staff of 40. The latter was made possible by employment of centralized control and maintenance, as well as use of natural gas fuel.

Projected for 200,000-kw operation, the first of the two 100,000-kw units to operate at an annual load factor of about 70% went on the system in July 1954. The second unit is scheduled for service in February 1955, as stated. The plant-site arrangement provides for the addition at any time of two more units 100,000 kw or larger.

The site is adjacent to a transcontinental railroad and near the cross-state gas transmission lines of El Paso Natural Gas Co. An adequate water supply is available from a large underground drainage basin over which the plant is built in mountainous desert terrain.

Interchange Agreements

Companion agreements entered into between the company, Arizona Power Authority and U. S. Bureau of Reclamation make possible the integration of Saguaro's 200,000 kw into the statewide Davis transmission system. From this strategic location in the south-central part of the bureau's transmission network, power generated at Saguaro is made available to practically the entire service area of Arizona Public Service.

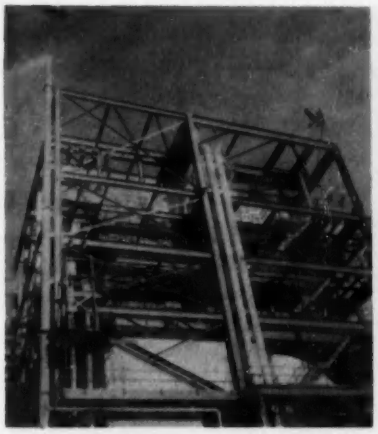
The new station also helps balance the input to the Davis system from Colorado River sources. Through the transmission agreements, the large block of power from Saguaro was added to the system with only minor additions to existing facilities. The only new facilities necessary to transmit Saguaro power were lines that tie the plant into the system and those facilities required at delivery points to handle the additional power.

Owing to excellent climatic conditions and savings in construction costs to be effected, the decision was made to build Saguaro as an outdoor plant. The control building, warehouse and the service building are the only building enclosures.

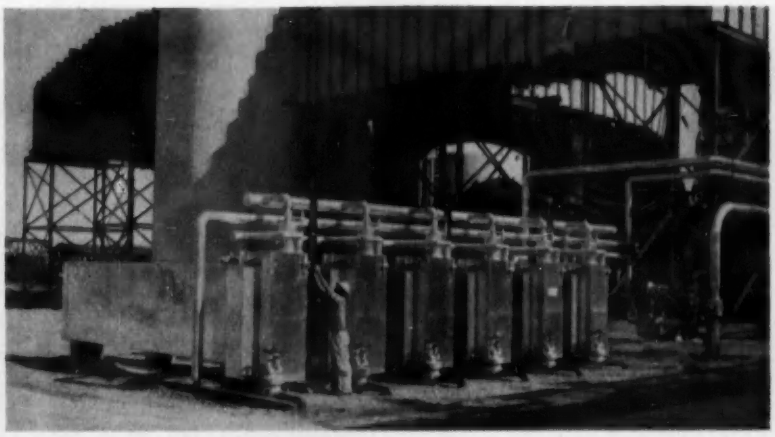
Cost Is $120/kw

Duplication of equipment throughout the station for both main units was among other items helping to keep the initial cost of the plant to $120/kw of capability. This estimated cost includes improvements at the site as well as the switchyard and high-voltage equipment.

The turbogenerators and associated boilers were located in an L-shaped position with boilers of both units adjacent and on a line perpendicular to the main turbogenerators in tandem. No. 1 boiler is located next to the heater deck, which is at operating level.



Boiler structure made good mounting place for microwave dish in communication system linked with dispatcher's office, Phoenix



Aluminum insulation was used extensively for piping and boiler duct work insulation

No. 2 boiler is in line and adjacent.

Natural gas was selected as the primary fuel. A storage tank of 55,000 bbl capacity has been provided for fuel oil stand-by. Heating and pumping facilities are connected.

Following are the main design and equipment features at Saguaro.

Design Conditions

Steam pressure	1,450 psi at throttle
Steam temperature	1,000 F at throttle
Heat rate	11,000 Btu/kwh, 2.5-in. Hg, 100,000 kw
Total water make-up	3,500 to 4,000 gpm
Centralized control	

Main Equipment Features

Turbogenerators — Turbines are rated at 90,000/99,000 kw preferred standard at 2½-in. Hg back pressure, being of tandem compound double-flow type with five-stage extraction. The generator is a 100,000-kw, 118,-647-kva, 85-pf machine, hydrogen cooled, having a short-circuit ratio of .8 and an output voltage of 15,500.

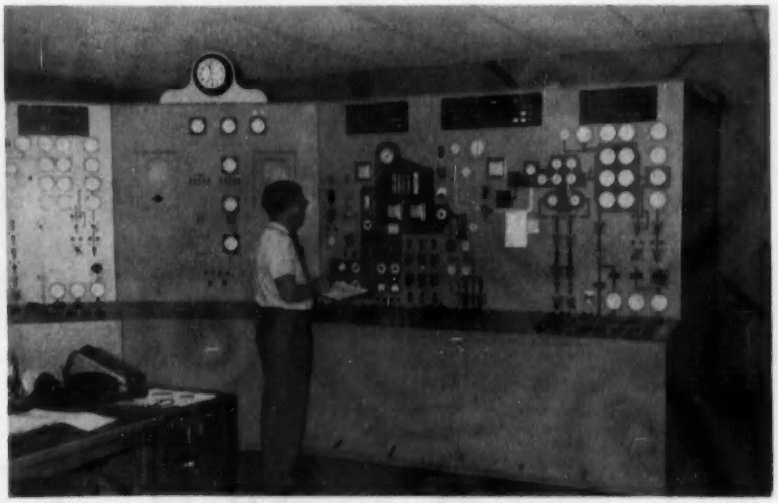
Exciters are connected through a reduction gear shaft to the main shaft.

Condensing Water System — The condensers are deaerating, two-shell, nondivided-water-box type having a surface of 75,000 sq ft.

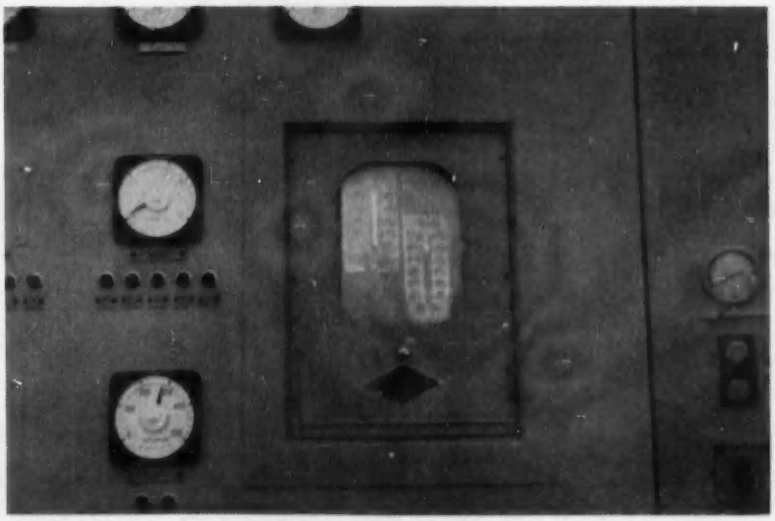
Cooling of the circulating water supplied to the condensers is by means of cooling towers. These are double-flow 16 F approach to a 70 F wet-bulb temperature, cooling range 16.6 F.

There are 10 cells in each tower over a common basin.

Boiler Equipment — Boilers are rated at 900,000 lb/hr continuous, having a designed pressure of 1,700 psig and superheater outlet pressure of 1,550 at 1,005 F, fired by natural gas and oil with provision for future coal:



Use of miniature instruments on mimix outline of equipment made compact control board



Operator is able to monitor water column in control room with closed circuit television

continuous pendant superheater counter-flow economizer, revolving heat exchanger air heater, two induced draft fans and forced draft fans.

A concrete tile-lined chimney will serve two boilers.

Electric Equipment — Electrical equipment includes one three-phase, 140-mva FOA, 15.5/115-kv transformer. Generator main leads are carried as isolated-phase bus from the generator terminals to a point just beyond the condensers and then run open on overhead structures to this transformer.

The generator leads are tapped for service to the auxiliary power transformers rated at 7,500 kva OA, 15.5/2.4 kv.

Auxiliary power to essentially all equipment is at 2.4 kv with the exception of all motors 300 hp and less, which will be operated at 480 v.

Duplicate source and supply to auxiliaries are provided.

Miscellaneous Features — Control room and service building are fully air conditioned. Boiler turbine-generator control panel is of the bench-board design with miniature indicating instruments on the face and recording instruments on the back.

Freeze protection is limited as temperatures seldom reach freezing, and then only for very short duration.

Summer temperatures as high as 120 F dictated design of electrical equipment and switchgear.

Communication between Saguaro and the system dispatching center at Phoenix is by microwave and telephone.

Artificial cooling of condensing water by cooling towers is provided.

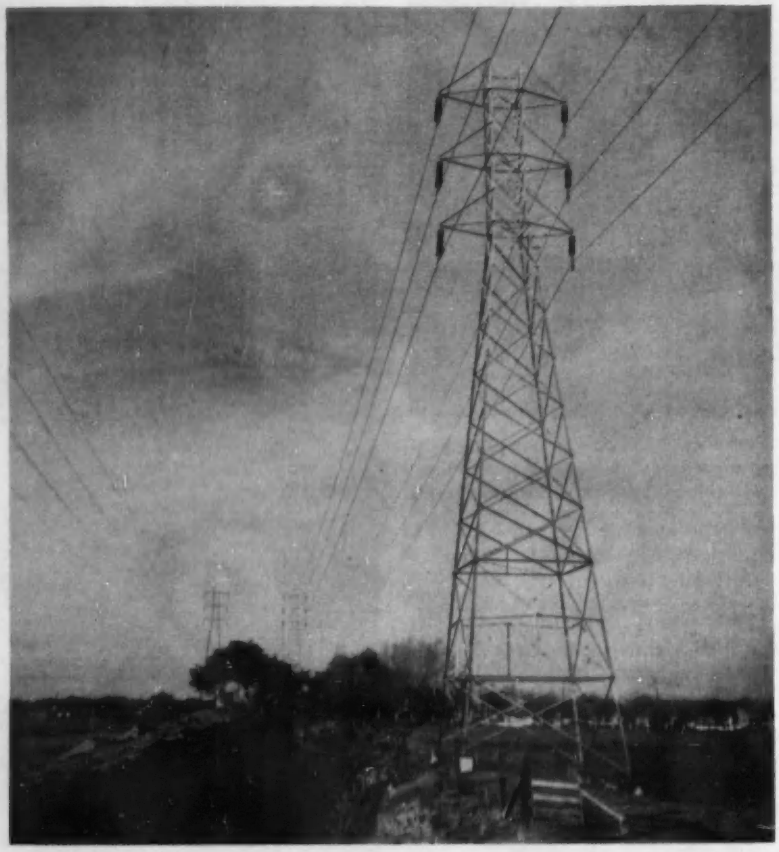
Water treatment—demineralizer.

Heat insulation is aluminum reflective insulation composed of a series of concentric sheets of aluminum alloy, separated by ½ in. air space and held in place with calcium silicate blocks.

Control Panels

Tunnel-bench type boiler-turbogenerator control panels, encompassing instrumentation of miniature design to reduce panel size, are used. Immediately accessible from the control room are the main units. Tinted glass windows in the room provide visual access to the plant area.

Enclosed building areas are illuminated by fluorescent lighting while incandescent light is employed outside. Use of light, Saguaro, green on all metal surfaces, with the exception of aluminum as basic background, harmonizing with a darker green trim, achieves a pleasing effect. Railings and other safety surfaces are painted an off-red orange.



Use of 715,000-cir-mil all-aluminum on double circuit tower line at right made possible increasing carrying capacity of line by three times as compared with No. 4/0 copper line on the tower line at left without exceeding design limits of the steel towers

All-Aluminum Favored

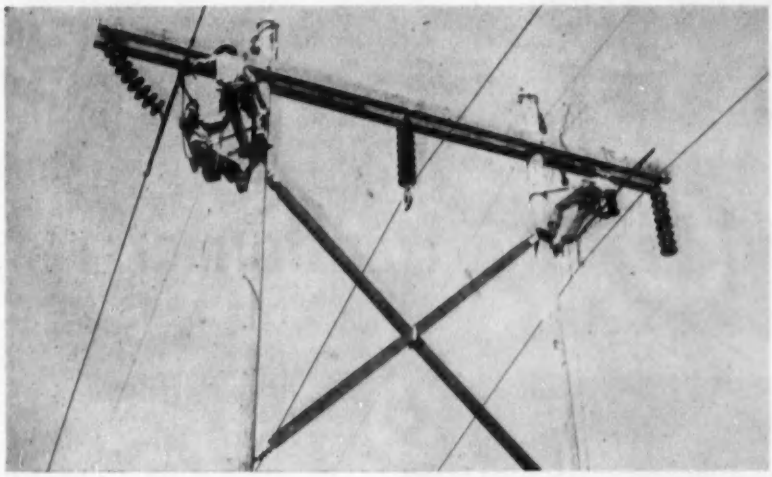
Based on more than 50 years experience with all-aluminum conductor on 60-kv lines, and with no appreciable trouble, Pacific Gas and Electric Co. feels that all-aluminum conductor has many advantages that have not been apparent heretofore. The company now has 2,860 circuit-miles (7,250 tons) of all-aluminum conductor ranging in size from 2/0 to 397.5 MCM in heavy, medium and light loading areas.

Experience leads to the emphatic conclusion that the initial cost, the light weight, as well as the natural strength and high elastic limit of all-aluminum instead of ACSR, of the same capacity, is justified not only from first cost of the conductor itself but also from the cost of material, labor, fittings and installation. With all-aluminum, the compressed splicing sleeves cost less, can be installed in about one-tenth the time and the centering of the sleeve is not so critical. The cable and armor rods have less diameter and, in some cases, take a smaller dead-end and suspension clamp. Vibration dampers are smaller and cost less. The conductor is lighter, hence costs less for transportation and installation. All-aluminum conductor in sizes up to 1,113,000 cm in light loading areas has given good service so far and with homogenous make-up, high elastic limit and low costs should be more economical than any other type and has no disadvantages if used with the required safety factors.

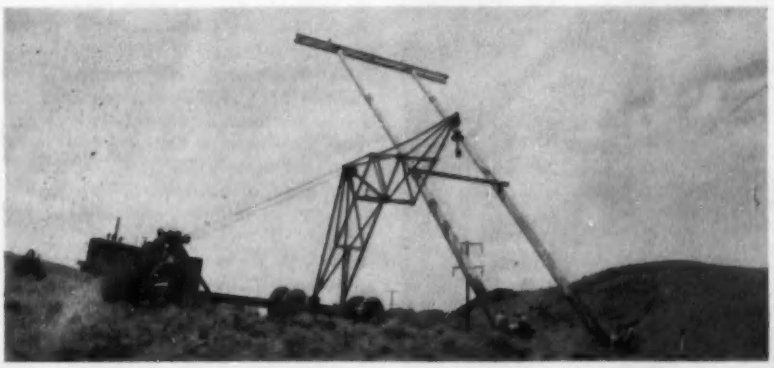
Full details of PG and E's experience with all-aluminum will be covered in an AIEE paper to be presented at the Utilization of Aluminum Conference at Pittsburgh, Pa., March 15-17, 1955.

Reel arrangement used to make possible stringing three 556,000-cir-mil ACSR line conductors and two static wires in one operation

New Line Integrates Montana System



Clipping in on tangent H-frame structure showing the use of X-braces and timber X-arms



Angular crane used by contractor to raise H-frame wood structures in one operation

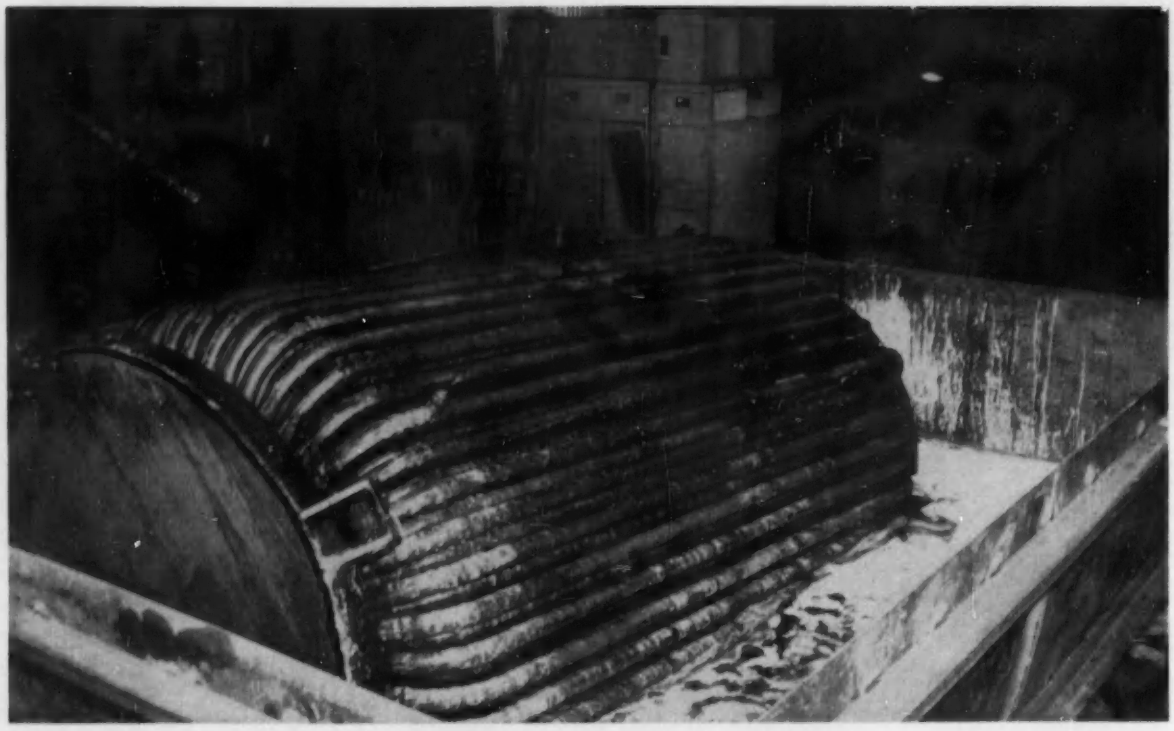
Further integration of Montana Power Co.'s far-flung system was recently effected with completion of a 223 - mile, 161 - kv transmission line from Anaconda to Billings. The line has nominal transmission capability of 60,000 kva and connects with the Billings steam plant of the same rating.

H-framewood pole construction as shown was used. Conductor is 556,400 cir mil ACSR; prevailing span — 780 ft. Two static wires were provided. Wood pole structures are X-braced using both Hughes Bros. and Joslyn braces. Crossarms are 6x10 in., 30 ft long, sawed timber.

For supporting the static wires, a three-bolt guy clamp with flared groove openings made an inexpensive and very satisfactory attachment. A through-bolt, through the middle bolt hole of the clamp, is the means of attachment. The static wire is held in the top groove and the ground wire down the pole in the other.

Contractor on the job, Compsey & Lytle of Denver, used the angular derrick shown in flat country. Where going was rough a single, tractor-mounted boom proved best for erecting the completed H-frame structures. All five wires were strung at the same time, using the reel setup shown. Wires were strung under semitension to avoid as little contact with the ground as possible.

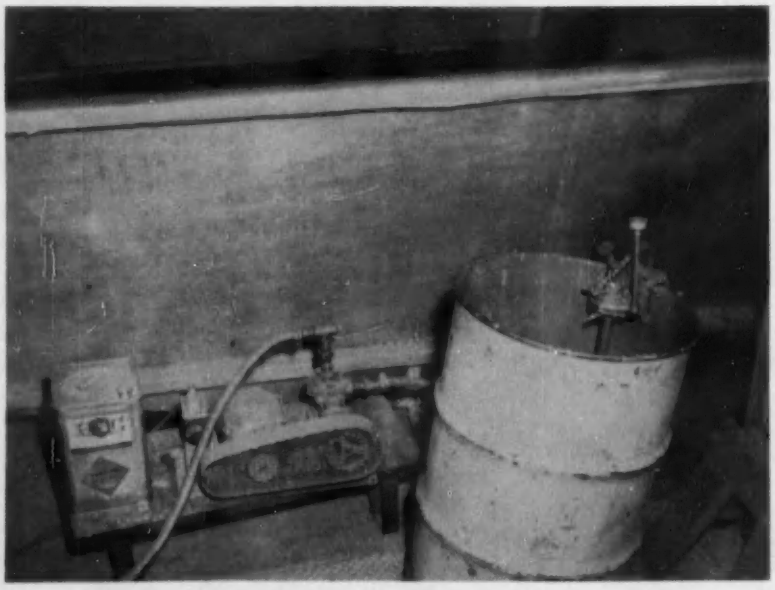
The new line assures the Billings area of adequate power when the Frank Bird steam-electric station there is not running. Billings is also served by five other transmission lines from hydro plants.



Caustic solution removes old paint from transformer tank. After trying many methods utility finds an easy and inexpensive solution

How to save on

Cleaning and Painting Transformers



Pump and paint agitator used for flow coating paint on large station-type transformers

Henry M. Hoffman

General Plant Division
Los Angeles Department of Water & Power

Confronted with the difficult problem of cleaning and painting large station-type transformers, the Los Angeles Department of Water & Power has developed a method of removing paint that saved 75% over previous methods and a method of flow painting that effected a 50% saving in labor. Many of the transformers in capacities up to 6,667 kva required for the department's 146 distribution stations have been in service for 20 years or more. Nearly all are of the self-cooled type, equipped with either radiators or multiple layers of cooling tubes.

Most of these transformer tanks are in such condition that it is necessary to completely strip the old paint from the tanks. The multiple layers of cooling tubes and the closeness of the radiator tubes made certain areas inaccessible for proper cleaning. Many

methods were tried, such as steam cleaning with a light caustic, sandblasting, shotblasting, by pouring hot caustic over the tanks and repumping from a drip pan back into the heated caustic tank. Varying degrees of success were obtained by these methods but none was entirely successful. Either the paint was not completely removed or shotblasting and sandblasting proved to be too expensive.

Cleaning

Studies and tests proved that a cold caustic solution 1½ times the strength normally used in a hot caustic solution would remove all of the paint within a period of two to three hours.

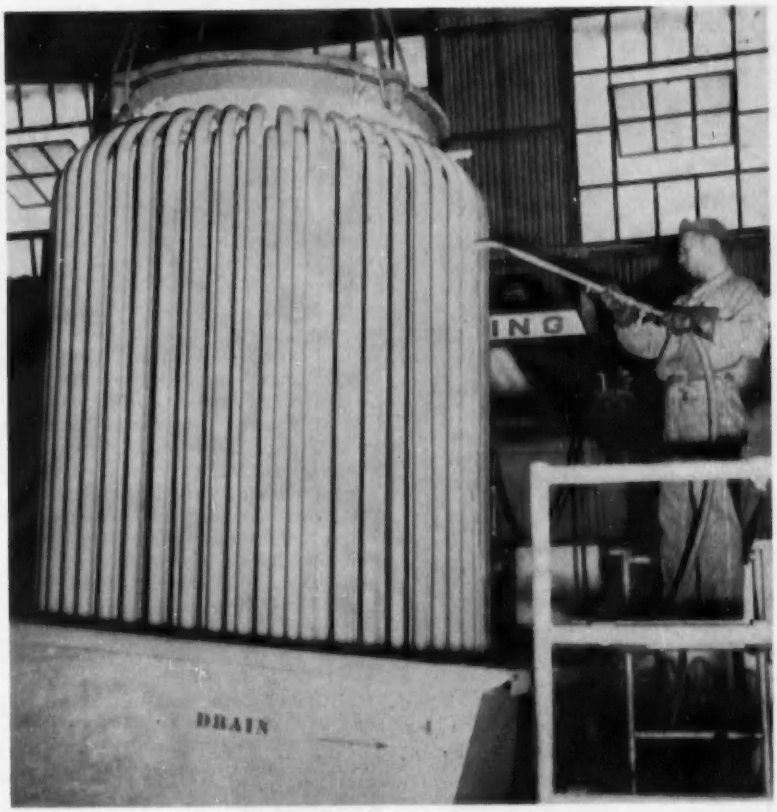
A large semicircular tank, 13 ft long by 10.6 in. diameter, as shown, adequate in size to accommodate transformer tanks up to 6,667 kva in size, was fabricated. The tank was filled with 2,000 gal of the following formula of cold caustic stripper solution:

Caustic soda 75%
Tetrasodium pyrophosphate 20%
Synthetic detergent 5%
1½ lb stripper to 1 gal water

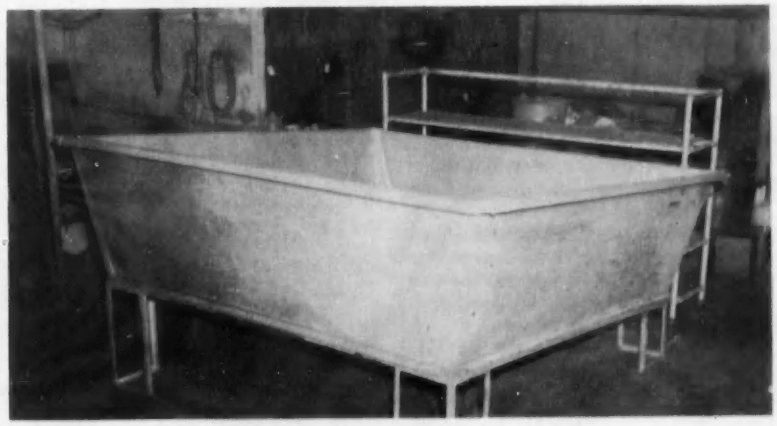
The method was tried out by cleaning six 1,667-kva transformer tanks that had to be completely stripped and repainted. The covers were placed on the transformer tanks, then made airtight and filled with 2 psi of compressed air to assure that no caustic solution would enter the tank. The tank was then placed in the caustic tank for cleaning. By this method, the tank had sufficient buoyancy so that one man could roll it around in the solution. It was found that this agitated the solution sufficiently to obtain excellent results. The tanks were removed from the cold caustic and flushed with water and then sprayed with a 3% solution of phosphoric acid, thereby obtaining an excellent surface for painting.

Painting

Inaccessibility of certain areas on the back side of the tubes and on the surfaces of the tank wall in back of the tubes required the use of flow painting. Although flow painting has been in use for a number of years, the department was not equipped for this process. A number of tests indicated that a much better film of paint could be applied and all surfaces would receive an equal film of paint. After tests were made and a process established the necessary equipment, including a rotary paint pump with a capacity of 10-12 gal per minute and other accessory equipment, was purchased. A large drip pan was fabricated in such a manner that a sump was formed on one side of the pan to provide the minimum exposure of the paint to the atmosphere. The paint is pumped directly from the pan and flowed onto the transformer tanks.



Flow painting case of 1,667-kva transformer. Paint is pumped directly from drip pan shown



This drip pan was built especially for flow painting operation. Transfer sits in pan

Flowability and thickness of the prime and finish coats were adjusted as required by varying the type and amount of thinner. The finish coat of approximately .002 in. thickness covering all areas flowed on very smoothly at a Demler cup viscosity of 10 seconds. This method of painting is considered a great improvement over the spray painting method as all tank areas and the front and back sides of the tubes receive the same thickness of paint.

The process was developed by supervisors of the maintenance, repair and shop section with the aid of engineers of the engineering section, both of the general plant division.

Here are some

New Developments in Aluminum Connectors

Richard Harap*
Field Engineer
Burndy Engineering Co. Inc.

The extensive use of aluminum cable for overhead secondaries and services is a relatively recent development. In the short period of time since these conductors were first installed, several important new connector design principles have been established. New connectors, based on these principles, are now coming into wide use. Field results are indicating that operating difficulties because of the effects of galvanic action, cold flow and differential thermal expansion rates can be successfully overcome.

Requirements

When designing connectors for aluminum, whether for overhead or other applications for which this conductor is suited, the same basic requirements must be met. These are:

1. The effects of the high resistance oxide film, present on all aluminum surfaces, must be offset.
2. Erosion of the aluminum conductor, because of galvanic action occurring when the conductor is placed close to copper in the presence of an electrolyte, must be eliminated.
3. Mechanical and electrical deterioration of the connector, whether because of galvanic action or stress corrosion, must be eliminated.
4. Connector contact areas, the manner in which pressures are exerted on the aluminum and the connector materials selected must all be such that joint deterioration because of the effects of creep is eliminated.

Two new and fundamental principles, evolved through basic research, meet these requirements.

On the basis of facts revealed in a basic study of the mechanism of galvanic corrosion and confirmed by extensive tests, it has been established that best results can be obtained by using properly designed and installed aluminum connectors for either aluminum-to-aluminum or aluminum-to-copper. Such connectors need not be plated nor do they require soldered-in copper inserts to avoid direct contact between the dissimilar metals. Aluminum alloys having no copper in their composition or the pure metal must be used in order to avoid stress corrosion cracking of the connector bodies.

Galvanic action occurs when dissimilar metals are close together and there is an electrolytic current path between them. The nature of this primary cell is such that the anodic material is attacked or is pitted, while the cathodic material is protected and remains unattacked. The two most important factors that are related to the severity of attack are: (1) the strength of the electrolyte involved; and (2) the density of the electrolytic current flowing across the anodic surface in the cell.

Stronger electrolytes, such as salt water, cause galvanic attack to be more rapid, which explains why the most serious aluminum-to-copper joint troubles have occurred in seacoast areas. Unfortunately this factor is not controllable.

It is possible on the other hand to control electrolytic current densities across the anodic surface. A low electrolytic current density can be obtained by placing a large mass of aluminum in contact with a small mass of copper (see Fig. 1). When this is done, the attack rate is kept low and therefore only slight pitting of the anodic aluminum surface may occur under severe conditions. This approach is readily applied to the design of connectors for aluminum.

When a connector is made of aluminum, is massive in the right places and then is installed on a copper conductor, the electrolytic current density across the large mass of aluminum connector is low. Any pitting that may occur is confined to an area on the connector where it has no effect on joint resistance or mechanical strength. Furthermore, when the connector is made of aluminum and is installed on an aluminum conductor, there can be no attack of the aluminum conductor because of galvanic action. In other words, neither conductor is attacked in any way and whatever galvanic corrosion occurs is isolated from current-carrying areas. Several new connectors of this type are shown in Fig. 2.

Properly designed massive aluminum connectors, such as those shown in Fig. 2, for aluminum-to-copper, are entirely stable in performance, even though connector and conductor materials have different rates of thermal expansion. Stability under heavy current loads is achieved by virtue of the heavy section of aluminum and the fact that aluminum surrounds copper in these designs, rather than the reverse. The connector therefore runs appreciably cooler than the copper conductor within it and the lower temperature of the aluminum connector compensates for its greater expansion coefficient. This can be demonstrated in current cycling tests at overload currents selected to produce a conductor temperature of 100 C, a

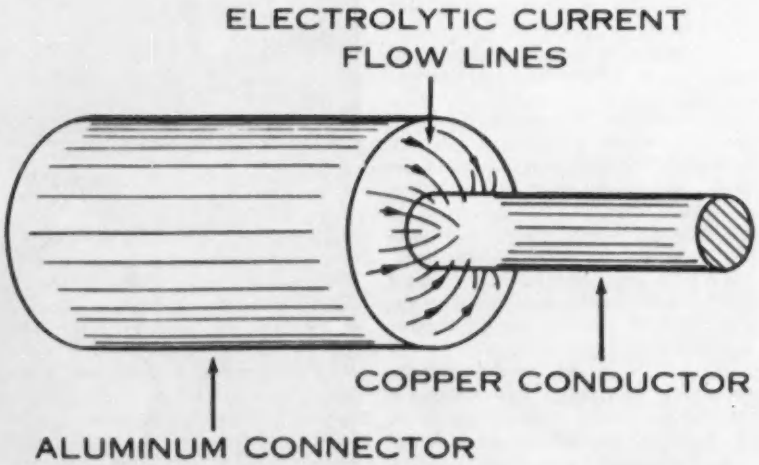


Fig. 1—Galvanic current flows from aluminum to copper in aluminum-copper primary cell

* Based upon the author's discussion of connectors at the last meeting of the Engineering Section of the Northwest Electric Light & Power Assn. held in Seattle.

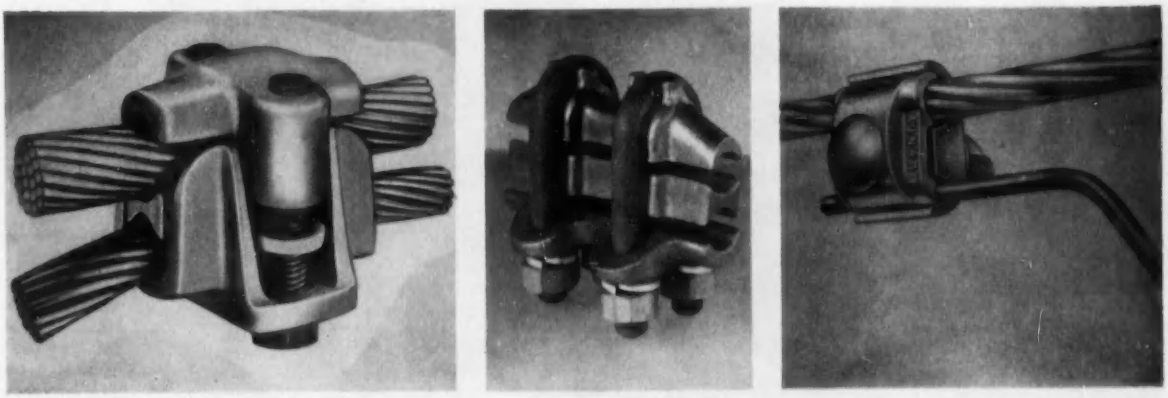


Fig. 2—Three types of massive aluminum clamp connectors suitable for making aluminum-to-aluminum or aluminum-to-copper joints

condition well in excess of what can be expected in field service. Typical results of such tests are shown on the curves in Fig. 3.

Compression

The compression principle, long in use in the design of tension splices for overhead ACSR lines, is another new approach which is now being applied extensively to distribution tap connectors for both aluminum-to-aluminum and aluminum-to-copper. By designing such connectors for aluminum-to-aluminum in a C shape (Fig. 4), and by properly controlling crimp depth, adequate correctly spread contact pressure is applied and low contact resistance is assured. The conductors are securely anchored against twisting, vibration and other stresses when the heavy-backed aluminum C is properly compressed and the open design makes it possible to slip the connector over a continuous line conductor. In addition, moisture is effectively sealed out of such joints. As with all other types of connectors for aluminum, a suitable oxide penetrating compound should be used.

Compression joints between copper and aluminum call for a somewhat different treatment, which involves the basic engineering approach described above. That is, the compression connector is made entirely of aluminum, is not bushed and is not plated. As shown in Fig. 5, this tap connector is formed as an L with one leg tubular and the other C shaped. It may therefore be slipped directly over continuous runs of either copper or aluminum and, by virtue of properly placed masses of aluminum, damage to aluminum conductors because of galvanic action is entirely eliminated.

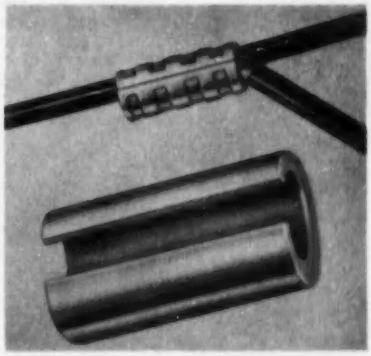


Fig. 4—C-type of compression connector

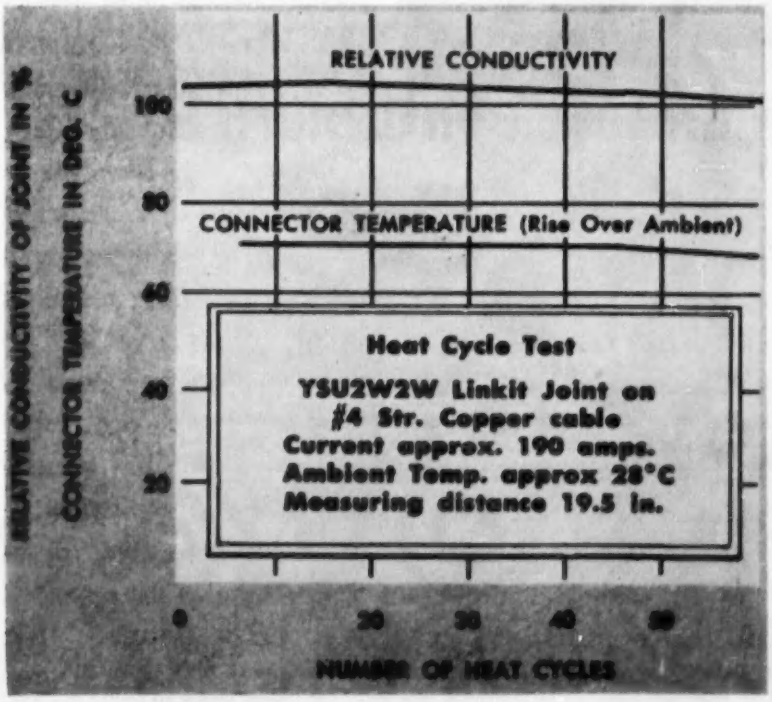


Fig. 3—Performance curves of aluminum connectors on copper during current cycling tests

Aluminum service drop cables may be joined to copper service entrance cables in the same general manner. In this case, the connector is a simple tubular aluminum butt splice (Fig. 6) supplied prefilled with an oxide penetrating compound.

The entire new group of compression connectors for distribution, which also includes types for copper-to-copper joints, has been designed to provide the simplest possible installation tooling with a minimum of tools and dies. A light, inexpensive compound action mechanical tool has been made available. It will handle all connections and all conductors up through 1/0 ACSR and can be standard equipment on the average service truck. For jobs calling for the larger conductors, hook-head hydraulic installation tools are available, with dies adapting them

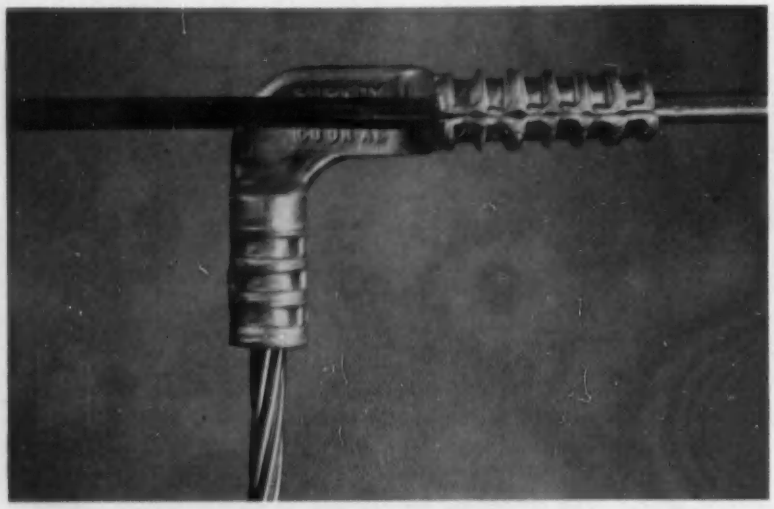


Fig. 5—Connector of compression type for use where run is copper and tap is aluminum

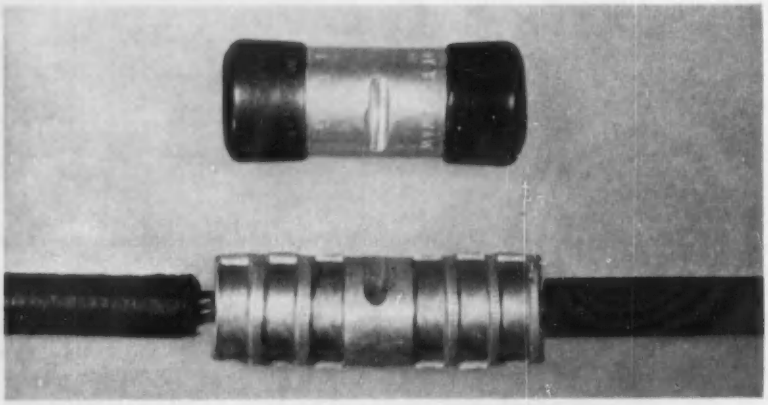


Fig. 6—Compression butt splice for services where aluminum and copper conductors join

to the installation of connectors of all sizes and types.

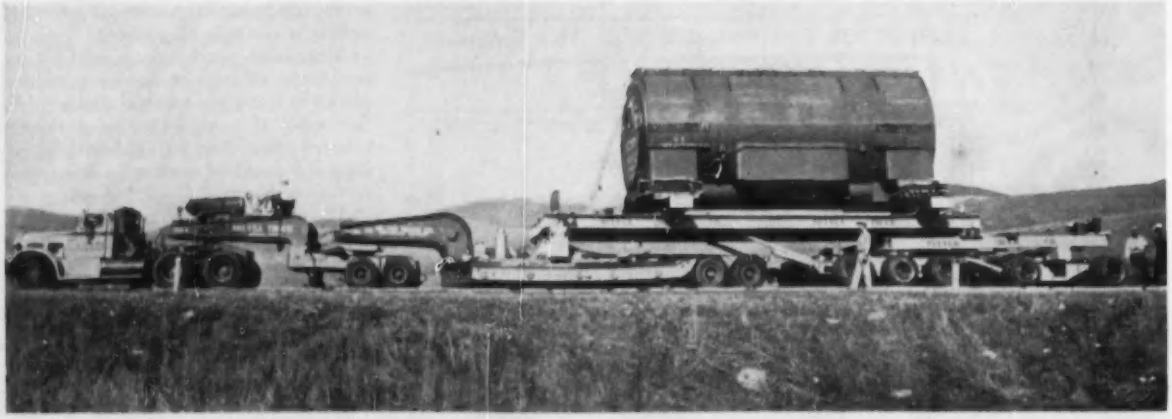
Compounds

Joint compounds, always essential where aluminum is involved, are simpler than ever to apply. A few of the older types having petrolatum-type bases are now available in collapsible metal tubes, but an entirely new spray-on compound has been developed to meet the field requirement for a more simple and effective method for sealing and reducing resistance of service connections of all types.

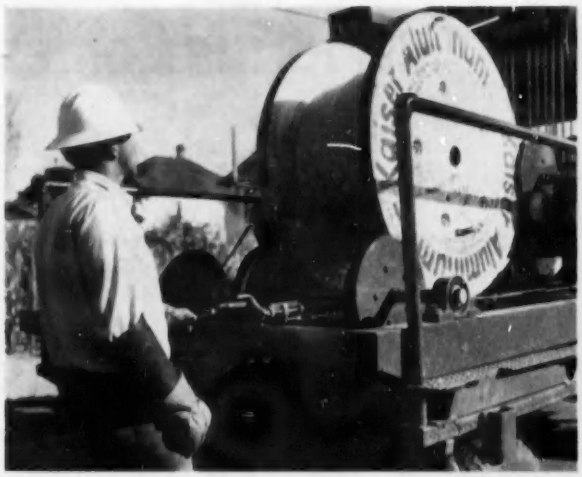
Its main component is a synthetic liquid of the polybutene type, which deposits from the spray bomb as a whitish foam, subsiding to an adhesive transparent nondrying film. This tenacious film is most effective in sealing out moisture from tap connections, even under extreme conditions, and since polybutene also has a very low surface tension, the film which it forms over the joint has the ability to heal itself if somehow broken in service.

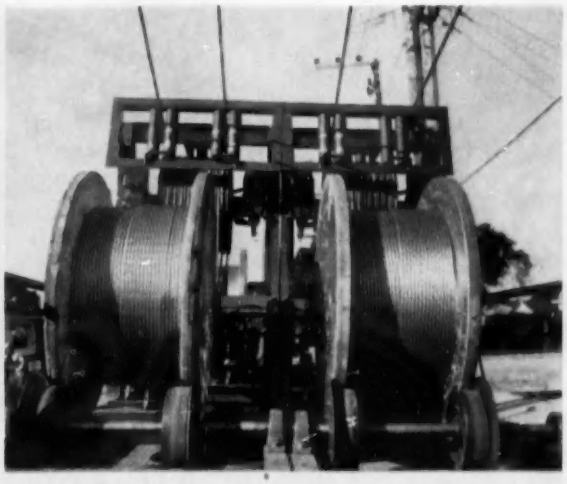
It has been found that polybutene liquids also have resistance-reducing properties, derived from an inherent quality of this synthetic, not shared with ordinary oils or greases, which enables it to neutralize the effects of the oxide film. Metallic particles, which as a component of the better paste compounds act to bridge the film, are therefore unnecessary in the new spray-on compound.

The basic research programs, from which the connector design principles described above have been drawn, are still active. They are certain to result in further improvements and conveniences in the field of connectors for overhead distribution.



TRANSPORTING THE 435,000-LB STATOR of the first 150,000-kw General Electric unit for the Morro Bay steam plant of Pacific Gas and Electric Co. required some of the heaviest duty trucking equipment to be used on a California highway. The special trailer shown in this photograph was required for the nine-mile trip. It was 89 ft long, 17½ ft wide and had 82 rubber-tired wheels. Its weight was so great that the California highway patrol asked that a carpet of 3x12-in. planks be laid on the highway for the caravan to pass over. The task of taking up planks and moving them ahead limited distance traveled to about a mile a day





Attendant regulates tension (left) by means of cranks. At right: Reels at each end of machine ride on flanged rubber-tired wheels

Four pairs of grooved bull wheels (left) hold tension. Right: Tension is so uniform that conductors are tied in without sagging

Wires Strung Under Tension

Advantages of stringing several transmission or distribution conductors under tension at the same time are so great that there is now a definite trend in that direction on the West Coast. The first equipment of this kind to be used by Pacific Gas and Electric Co. was employed recently in stringing a 266,800-cir-mil, all-aluminum 22-kv line at Pacific Grove, Calif. The device, made by the Petersen Engineering Co. of Santa Clara, Calif., is shown in the accompanying staff photographs. This particular machine will string four conductors under tension up to a size of 366,000-cir-mil ACSR or all-aluminum. As may be seen, there are four sets of grooved drums or "bull" wheels 26 in. in diameter, around each of which there are four wraps of the wire to prevent slippage. Grooves are neoprene lined to prevent damage to the conductor and further to insure against any possible slippage. Vertical rubber rollers guide the wire on and off the bull wheels.

On the shaft of each of the bull wheels there is a smooth acting brake of the type used for emergency braking on heavy earth-moving equipment. A small flexible steel cable leads from each pair of these brakes to a crank on the bed of the machine, giving perfect control over braking of the bull wheels.

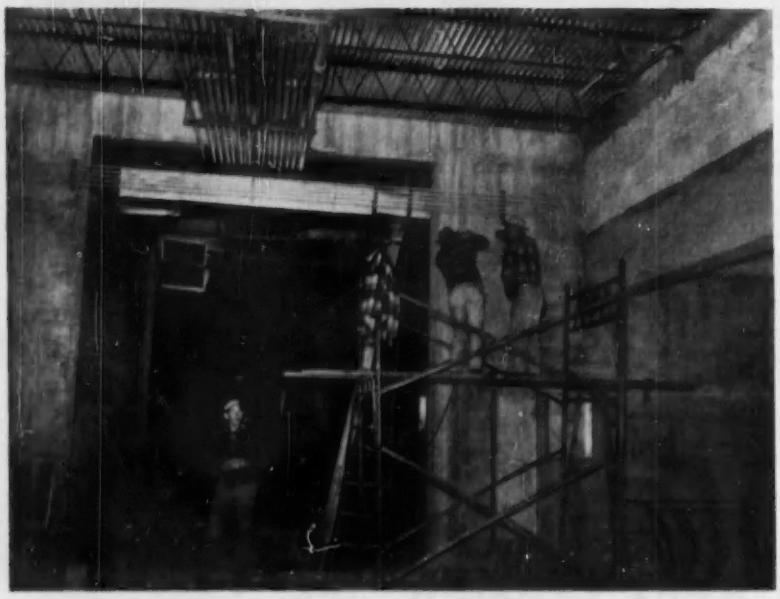
An interesting feature of design is the manner in which the reels of cable are supported. Two shafts with flanged rubber-tired wheels are adjustable so that the rim of any sized cable reel rides on these rubber tires. A brake on each shaft of the same type as that used on the bull wheels permits the degree of retardation necessary to keep the conductor under tension between the reel and the first bull wheel.

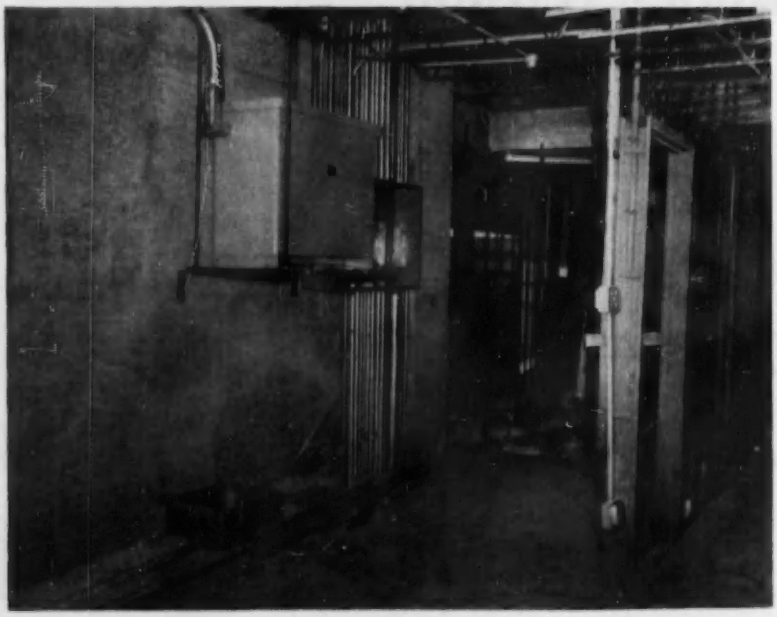
After a few pulls, an interesting thing developed.

The braking system permitted such nicety of control over total tension in the conductors and relative tension between conductors that it was possible to dead-end and tie in directly without any sagging operation, thus effecting a considerable saving in time. Primary purpose of the tension stringing was, of course, to keep the conductors out of hot 4-kv primary and other circuits below. Even though there is little possibility of contact with hot lines with tension stringing, nevertheless the machine is grounded as a safety precaution.

The same machine as here described is also available with power-driven bull wheels so that wires may be pulled out under tension without damaging the conductor as well as strung in on reconductoring jobs.

Those familiar with line construction predict that tension stringing will soon become general practice, even on new work where no other lines are involved.





Florida Comes To Las Vegas

Florida came West to share in the fabulous flow of silver dollars in Las Vegas, Nev. Among the half dozen new expansive hotels and casino-theaters now building in that incredible town is a nine-story concrete hotel in the Florida style, built by interests from Miami and due to open with a super colossal premiere on Jan. 1. It is called the Riviera and covers many acres along the already fabulous highway "strip" southwest of town. A Florida general contractor, Taylor Construction Co., is erecting it, but a California and Nevada electrical contractor, Acme-Collins Co. Inc. of Stockton and Las Vegas, is wiring it and in a rather new but logical way. Engineering was done by a Florida company also.

Use is made of the distribution economy of 480 v to serve the scattered and yet heavy loads this type of building requires. With dry-type transformer banks, 32 of them, ranging from 30 kva to 112 kva, the hotel, casino and restaurant theater is studded with small substations near centers of load. Primary comes from a Southern Nevada Power Co. outdoor substation at 12,000 v, is metered on the high side there, then transformed to three-phase 480 v and brought in underground in conduit to a main distribution panel at one corner of the building. From there the 480 v radiates to the 32 transformer banks, which step down to 120/208 v, three phase, four wire to lighting and small power panels. For the hotel there is a transformer as shown in the lower picture at left for each two floors in each wing, each bank serving parts of two floors.

There are other transformer banks of the same kind to serve the casino (being mounted in center photo), the restaurant and the theater. The theater is to have a large dimming panel located in a booth above the restaurant and facing the stage. Power for the air-conditioning equipment is taken at 480 v by bus duct to the motor control center.

For emergency lighting and for one elevator, lobby, theater and casino lights a 200-kw GM dual engine driven generator set is provided. Extensive sound and telephone systems are also installed. The lighting of grounds and pool is to be sensational too and lavishly applied.

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

For a clean start

Evidence that this column is read comes from our mistakes, seldom from our virtues. To clean the slate for the New Year may we apologize for any "goofs." They certainly were unintentional. We aren't mad at anybody or promoting any cause. Our aim is to report what is going on. We do not make the news. Often a deadline or a lack of space for more details make necessary a chance on strict accuracy. Sometimes what may seem to be a criticism by us is one heard from others and reflected here, as a guide to what reaction exists. In serving the entire industry many controversial issues are touched. These are not our quarrels, but unfortunately whatever is reported about them is bound to displease someone. If opinion creeps in it may be the perspective of experience whispering a word of caution. After all you are running your own business. We only report what others think of it—to guide you to make it better.

Green light

If all of the prophets of business are to be credited 1955 should be a strong construction period. Competitively it will be rough, not only within each industry but between all for more of the consumer's dollar. Every gimmick and device will be tried to woo business, even selling. But competition among businesses means that many will remodel stores, offices, plants, homes in order to compete. Today that means more electrical features. Western migration continues to make a demand for more houses, shopping centers, brings more industry. With good volume in prospect contractors could do well to be satisfied with fewer jobs but do them better and at a profit.

Strong support

Promotion of wiring will be at an all time high in 1955. Not only the long-alone leagues but most of the utilities, the manufacturers of wiring materials and even the contractors seem to be aroused. And appliance dealers have felt the pinch of No. 14 wire. If contractors get themselves into the act it could be made a year of good business opportunity, one in which they can more easily sell their fair price.

Enlist the dealers

Pacific Gas & Electric will step up its program of promotion on adequate wiring strongly in 1955. Its program will be beamed toward educating appliance dealers and contractors to take advantage of the various financing plans available from the banks and loan companies in the area for the modernization of home wiring and installation of major appliances. It also plans a strong activity to get the tract builders to wire up to the NAHB voluntary standard for service entrance of 100-amp and to put in more certified homes. Space heating promotion will also bring the requirement for more wiring to supply it.

Financing results

Portland General Electric's financing program got off to a flying start with six months' operation showing 250 contractors participating and work financed to $49,688, according to Adequate Wiring Reporter. Arizona Public Service program suffered from lack of promotion but a series of 16 meetings was being planned by Bud Schaff beginning in January to merchandise the idea.

Certify lighting

San Diego will be the first in the West to launch the National Lighting Bureau certified commercial and industrial lighting program. It will be carried by the San Diego Electrical Contractors division of Bureau of Home Appliances. Dan Turner will teach the sales course and Carleton Thompson, both of SDG&E, will handle the practical engineering course. It will be backed by utility advertising and mailings.

FHA will revise

FHA and VA are ready to recognize the industry's request that it raise its minimum standards for wiring. At a meeting Dec. 14 in Washington it asked an industry committee to recommend changes to its requirements and submit them in January. When these are accepted one of the big blocks to tract builders accepting the NAHB standard will be gone. It means that an adequate wiring job can be financed in the original loan, without adding on to the down payment.

Control show on wheels

Controllability is electricity's greatest asset and a variety of means to control it will be put on view when Superior Electric Co. of Bristol, Conn., brings its remarkable mobile display into the West in January. Coming from New Mexico and Arizona it will reach southern California for a series of stands beginning Jan. 24, remain there through February, come to northern California in March and apparently then go to Oregon and Washington. With a self-contained generating plant, its truck and trailer shows the company's complete line of Powerstats, Stabline regulators, dimming equipment, Varicell d-c equipment, Voltbox a-c equipment and five-way binding posts. In southern California E. S. Williams and northern California Marvin Stokem, factory reps., will book showings to contractors, distributors, colleges, etc.

Will try again

With the new Congress another big effort will be made by National Electrical Contractors Assn. and other subcontractors to get the national legislation it has sought for two years to get enacted aimed at stopping bid shopping and peddling on government contracts. AGC again is lined up against NECA saying that it will accomplish the same purpose with its code of ethics, but AGC doesn't represent enough generals, even if it could police its members. The segregation of bids is already required in many states.

Lots of bills

California's legislature will have before it a list of bills prepared by the Construction Industry Legislative Council. It includes amendments to the subcontractors' listing law, some amendments to the Contractors License law, changes in the architectural practice act and a bill to require expeditious payment of subcontractors when progress payments are made to the prime contractor. Ernest Kramm, No. Calif. Chapter NECA manager, represents the electrical contractors on the council.

More states

Efforts will be made in several other Western states to enact legislation for the electrical industry. In Utah a bill to enact a state electrical code and inspection is being prepared. In Idaho amendments will be sought to the existing but inadequate law to allow fees to be charged for inspection and thus support it. In Washington a similar provision will again be sought. Montana may also have a state inspection law submitted. Although talked of in Nevada and Arizona there was no real activity for such legislation organized as yet.

Sad note

William E. Blackmar Jr., who had been manager of the Montana Chapter, NECA, later assistant field representative and lately manager of the Southern Colorado Chapter, in Colorado Springs and Pueblo, died of heart attack Nov. 27.

Concentrate

Ed Grogan, manager of the San Joaquin Chapter, Stockton, resigned to devote his full time to the two other associations he manages, the plumbers and sheet metal contractors. Until a successor is appointed Matt Sherwood, Western field director, has been handling the chapter affairs.

Established

Alameda County branch of the Electrical Industry Depository of California Inc. has located an office at 656 31st St. at Grove, Oakland. It is in the Allen Building, Room 216, telephone number Piedmont 5-6037, A. E. Rowe, custodian has announced.

School days

Arizona Chapter, NECA, will start an estimating course early this year, Jerome Kelleher, manager, announced. Teachers of the course will be Mike Setne at Phoenix and Bob Lamp in Tucson. The Phoenix course will be conducted at Phoenix Technical High School; that in Tucson at Evening Vocational High. Both will run for a total of 72 hours, two hours on each of 36 nights. About 25 were signed up for Phoenix, 15 in Tucson. The previous accounting course graduated 17 in Phoenix, 12 in Tucson.

Hot news

A new glass radiant heat called Crystalheat is now being manufactured at Van Nuys, Calif. The heating element is fused in a special Perma-tempered glass that resists breaking. Panels are individually thermostat controlled. The Crystalheat heaters come in wall panels or baseboard units. San Francisco agency is H. S. Tittle Co., located at 85 Columbia Square.

To train foremen

A supervisory personnel training program is being offered by NECA in cooperation with the Training Within Industry Foundation. Discussion leading, job instruction, job relations and job planning are the subjects each of which would have a separate course for training of those who would later conduct similar courses for the chapter members.

Pacific Section

Hawaiian Chapter of International Association of Electrical Inspectors has asked the Southwestern Section to release it so that it can form a new Pacific Section of IAEI. Approval of the move seems to be assured.

Not local

Despite protestations of getting local subcontractors to perform much of the work, the new cold-rolling mill of Kaiser Aluminum & Chemical at Trentwood was installed by Foothill Electric of Oakland, a Kaiser subsidiary. Local contractors were not even invited to bid.

Aid to A-W

Kennecott Copper Corp., in addition to its clever ABC booklet on home wiring, has a large wall chart showing load and circuit requirements for home wiring systems for use by contractors, architects and designers. Copies may be obtained from Kennecott Copper Corp., 161 E. 42nd St., New York 17. It gives the designer quick information on the circuit capacities, circuit protection, type of circuiting and outlets to specify.

Around now

The 1955 annual Adequate Wiring Conference will be held at LaSalle Hotel, Chicago, Feb. 24 and 25. Because of the new interest aroused on the subject the meeting is considered to be one of the most important in the long history of the organization.

Study instead of a show

An electrical maintenance conference will take the place of the usual show by the Electrical Maintenance Assn. of Southern California this year, April 6 and 7, at the University of Southern California. Six conference sessions are planned, conducted by men in the industry. Meetings will be held all day Wednesday, April 6, and Thursday morning, April 7, with a field trip to Lever Bros. plant in the afternoon.

Return engagement

The second Plant Maintenance and Engineering Show, conducted by Clapp & Poliak Inc. is scheduled for July 12-14 at the Pan Pacific Auditorium in Los Angeles. It will cover all phases of maintenance, not merely electrical.

Keep the desks hot

Where even chicken coops are air cooled, it is odd that the schools have never been air conditioned. Phoenix, Ariz., is now contemplating a big air conditioning program in order to use the schools on a year-around basis with four quarters instead of two semesters. This would permit a 25% additional student enrollment, made necessary by the great influx of people. The program for existing schools would cost $3,500,000.

Soon to move in

Fluorescent Fixtures of California's new factory and offices on the Shaw Road in South San Francisco near the airport was about ready for occupancy as this went to press. The new 66,000-sq-ft home of "All-Brite" fixtures will have the latest production line methods and techniques, tooling for metal fabricating and finishing, parking for more than 100 automobiles. It is the fourth enlargement necessary for the company founded ten years ago by Ernest O. Anders, its president.

Meant it

Some of the subcontractors who worked on the new Underwriters' Laboratories building, described in this issue, thought it was "just another job" and attempted some of the usual substitutions. However, to their cost, it was "Underwriters' Approved" or nothing. They learned a new respect for UL and what it stands for. Being familiar with UL standards, electrical workers for Roy Butcher Co., electrical contractors, had the very least changing to do of all crafts.

Succeeds

James A. MacNabb has been made electrical engineer in charge of the new UL laboratory at Santa Clara to succeed the late Howard Dodge. Mac has been with the laboratories since 1937 and joined the San Francisco laboratory as associate electrical engineer in 1948.

Meet new manager

A series of area meetings are to be held by the Pacific Zone, National Association of Electrical Distributors. Art Hooper, new national manager of NAED, will attend and speak at each of them, according to Bill Jewell, zone manager. First will be at Riverside Mission Inn, Jan. 21, the next probably at the Claremont, Berkeley, Jan. 27. Next at Portland, Jan. 31, and Spokane, Feb. 3. Dates for the annual convention have also been set, Jewell says—Sept. 26-28, at Empress Hotel, Victoria.

Alternates

Wescon show will be in San Francisco this year—Aug. 24-26, Civic Auditorium.

Reversed

Decision in a case taken to the Council on Industrial Relations by Casey Electric Co. over a $5 a day travel expense for linemen working on the Anaconda Aluminum Co. plant at Columbia Falls, Mont., was decided in favor of the contractor by the council.

Workers named

Westerners on the nine standing committees of NECA appointed by Don B. Clayton, its president: Line construction, R. C. Hughes, Portland, is chairman. Charles A. Wikle, Los Angeles, and Walter A. Soule Jr., Denver, committeemen for Districts 6 and 8. Business development, A. L. Berg, Los Angeles, A. R. Woolley, Pocatello. Governmental affairs, J. D. O'Connor, Sacramento, and Claude Detweiler, Twin Falls. Codes and standards, G. H. Sutherland, Portland, and Bert Stiles, Denver. Research, Earl Peak, San Francisco, and W. P. Robbins, Salt Lake City. Council on industrial relations, J. D. O'Connor, Sacramento. National joint apprenticeship and training, J. A. Simpson, Cheyenne. National Employees Benefit Board, W. R. Grasle, Portland, W. P. Robbins, Salt Lake City, and R. C. Hughes, Spokane.

People

Other names in the news: Mike Curry, 736 18th Ave., San Francisco, has taken over the Litecor Inc. of Brooklyn line of switches, receptacles, etc., and carries warehouse stocks . . . Henry Bente and Bob McCandless, consulting engineers, have moved to 3218 N. San Gabriel Blvd., San Gabriel . . . F. L. Hockensmith, formerly manufacturer's agent, has become associated with Roy Brown at Allied Industries Inc., Los Angeles . . . Henry M. Day, who has been director of the FHA office in Salt Lake City, was promoted to assistant commissioner for operations and moved to Washington, D. C. . . . Michael Garris, consulting electrical engineer, has moved to larger quarters at 2624 W. 6th St., Los Angeles . . . Bob Ford left Smoot-Holman Co. to join Westinghouse Electronic Tube Division . . . Bill Jones, former teacher at Lick-Wilmerding High School, San Francisco, and recently consulting electrical engineer in Menlo Park, was to join Smoot-Holman Co., Inglewood, as assistant research engineer in charge of the company's new testing laboratory . . . Ben Ruby, president of Ruby Lighting Corp., Los Angeles, died Dec. 26 . . . Another lighting man, Earl Marsh, retired from PG and E, died Dec. 20 . . . R. E. Roberts succeeded James Fletcher as manager of the Seattle office of General Cable Co. He came from San Francisco.

Booster heater

Hotter water for commercial kitchens to meet the state and city health codes can now be provided with a booster heater, announced by "Chromalox," Edwin L. Wiegand Co. Cafeteria water from a central system, whether electric or other, usually heated to 140 F, is 40° short of the required 180 F. The new circulation instantaneous heater, which fits in the unused space under the washing table, has a packaged insulated unit, can be installed easily.

For line contractors

Pengo Tension Wire Stringer for overhead power line conductors has been developed by Petersen Engineering Co. of Santa Clara. It takes reels up to 69 in. in diameter and any conductor to 556 MCM ACSR. It can be easily controlled with brakes for up to four reels simultaneously by one man. Conductors follow the multigrooves on the aluminum bull wheels, which are neoprene lined. The four-reel unit fits most standard trucks or trailers. A larger unit for sizes up to 954 MCM is also to be made.

Kinks contest

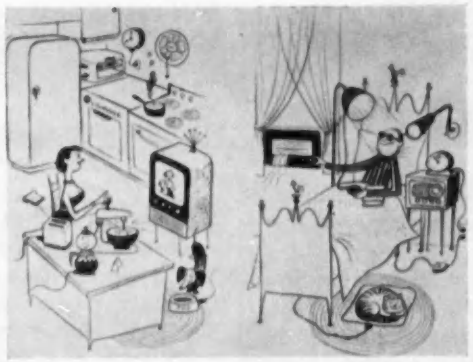
Eleventh annual prize award contest for ideas of the National Industrial Service Assn. closes April 15 with the 14 prizes totaling $350 for shop kinks that can be used by all members. The prizes will be awarded at the 1955 annual meeting, to be held in Los Angeles at the Statler Hotel June 6-10. William M. Hogue, Larsen-Hogue Electric Co., Los Angeles, past president of NISA, is general chairman for the convention and it has an active committee planning the details.

Winners

Only two Western winners were announced in Electrical Construction and Maintenance magazine's Light's Diamond Jubilee lighting competition for electrical contractors. Jerry F. Burt, Burt Electric Co., Fallbrook, Calif., won first prize in the residential lighting classification for the lighting of his own residence. Ralph B. Nuelle of Gibbs Bros. Electric Co., Los Angeles, won an honorable mention in the miscellaneous classification for the lighting of "Our Lady Queen of Angels" church, Los Angeles.

Action intended

It is everybody's problem and so distributors, manufacturers, dealers, contractors, union, and utility are coming together in a big meeting in San Francisco, late in January, to do something about wiring.



Kennecott's consumer cartoon book and its ads in national magazines do it well; it behooves all to . . .

Let's Make Adequate Wiring "Human"

Best news in a decade is that FHA met with electrical industry committees and agreed to revise its minimum standards for home wiring. It has asked the industry committee to come back with proposed revisions to the FHA requirements. This alone may remove one of the most difficult blocks to the promotion of wiring adequacy. If so 1955 should see this long needed change and the promotional programs of the industry should really get off the ground. And there are more of them forecast for 1955 than in any previous year.

Not only are individual manufacturers doing so but the whole electrical industry seems to have awakened to its No. 1 roadblock and is organizing everywhere to remove it. In brief, here are some of the significant developments.

1. FHA and VA revision of minimum standards will mean that houses financed under either can have an adequate job installed and covered in the initial loan without an extra payment for the difference.

2. This means that the voluntary service entrance standard of 100-amp equipment and more circuits approved by the National Association of Home Builders will be adopted by a large number of tract builders.

3. More national advertising is being done. It is more human and less technical in its approach. Anaconda Wire & Cable Co. ads in national media use photos to illustrate family needs for electrical wiring to take care of all the appliances of today. Kennecott Copper Co. has clever cartoons to tell the same story in ads and booklets. National Electrical Products Co. has cartoons in a series of ads pointing up the dangers of "do-it-yourself" wiring. Arrow-Hart & Hegeman Co. has illustrated home booklets that tell a consumer-interest story. There are many more such campaigns in preparation for 1955.

4. Leagues and bureaus, supported strongly by power companies, all plan intensified drives in the year ahead. Following up on Northern California Electrical Bureau's TV cartoon spot campaign early in 1954, that bureau is making wiring a major item on its budget, will launch the 1955 drive with a big meeting Jan. 15 to organize the industry to take full advantage of Pacific Gas and Electric Co.'s February advertising in 250 newspapers, one million bill inserts to customers, stories in *PG and E Progress* and displays in 135 company offices.

San Diego TV spots emphasize FHA loans

Electrical Contractors of San Diego, a division of the Bureau of Home Appliances, has a TV series going aimed both at new and at rewiring and emphasizing that FHA title 1 loans are available. In this it has the backing of San Diego Gas & Electric Co. and several loaning agencies. One, San Diego Federal Savings & Loan, assigned M. A. Tate, loan officer, to work with Carleton Bunce and the contractors' group. Again a human appeal is made in the TV announcements.

5. Financing of rewiring, started in 1954 by Arizona Public Service Co., Portland General Electric Co. and Washington Water Power Co., will receive more promotion in 1955. PGE did the best job of it in 1954, with a contest among contractors and dealers, lots of advertising and stimulation. Arizona Public Service had minor reaction to its plan but says it is because it was merely offered but not merchandised. This year it plans to put steam behind it. Washington Water Power is making a test run of it to see if it takes. Several other utilities are considering it, watching these pioneers' experience with it. Others are aiming to promote the availability of loans from banks and loaning agencies without offering the convenient "package" payable along with the electric bill. All of these signs point to 1955 as the year for wiring.

ELECTRICAL WEST

A Break for Young Engineers

IN recognizing that the professional society has a separate and special responsibility to the younger engineering graduate the Los Angeles Section of AIEE has set a commendable pattern for the whole society to follow. What has happened in the few months since Dr. George T. Harness, head of the electrical engineering department at the University of Southern California and chairman of the Los Angeles Section, inaugurated the Young Engineers' Council indicates that the need for such a program has long existed. It proves that, if given a vehicle, the younger men will take advantage of the opportunities for professional advancement the AIEE professes to provide for all its members.

Attendance at meetings and interest in the Young Engineers' Council shows that it is filling what one educator has called "the lost ten years" between graduation and the achievement of some degree of maturity in the profession. It is providing both a forum for problems that are peculiar to the younger engineers alone and also is furthering the development of fellowship that the younger men cannot hope to attain in general section meetings.

One can safely wager that a similar program for younger engineers in AIEE would be equally successful in all of the larger sections.

TV Child Is Now TV Giant

DEVELOPMENTS in television in 1955 are going to have a marked effect on many segments of the electric industry. In point of volume for dealers and distributors it is No. 1 among all appliances and should continue in that position even though total set sales are expected to drop this year.

To the power companies TV already has become an important user of energy. One estimate puts annual energy consumption by TV sets close to the 10 billion kwh mark. TV now accounts for 8% of the energy consumption in U.S. homes. Color television will increase that figure considerably because color sets consume 1.5 to 2 times as much electricity as black and white. Color TV is expected to make important gains this year. Half a dozen major manufacturers will be in the market slugging it out for customers. Prices will come down but color TV, strikingly beautiful as it is, will still be out of the economic range of the great mass of buyers. However, within two years most of the new sets sold will be the color variety.

When that happens, TV will outrank many modern appliances in home energy consumption. We wonder how many power company people are cognizant of that.

Set Oregon's Record Straight

PEOPLE who know the facts will not subscribe to the fallacious belief that because Oregon voters put Richard Neuberger in the U.S. Senate the state is now unalterably committed to public power. Interviews with Oregon's senior senator, Wayne Morse, published in national magazines completely ignore what should be conclusive evidence that Oregon is a private power state. This is that, even with a huge amount of federally subsidized public power on its very doorstep and with enabling legislation on the statute books to make public power operation easy, the Oregon voters have turned down every public power district election since 1940.

Even more significant than the long-term picture are the returns on three public power measures in the very election that sent Mr. Neuberger to the Senate. As news stories published in ELECTRICAL WEST reported, each of these measures was defeated by a substantial margin. A proposal to expand the Lincoln County PUD was defeated by 1,586 to 401. A bond issue for additional facilities for the Tillamook PUD lost out by 3,694 to 2,535. Voters also approved the dissolution of the Union County PUD, 3,652 to 1,912. Previously they had turned down two bond issues to put this district in business within a period of three months.

EDITORIAL VIEWS

A fact that further refutes the effort to class Oregon as a socialized power commonwealth is that two candidates for Congress and one nominee for governor who campaigned in favor of public power were defeated. Finally, something more than 80% of all of the electric customers in the state are served by business-managed private utilities.

Facts are facts and politics is politics. Senator Neuberger, like Senator Morse, may favor public power. However, that did not elect him.

Lock That Back Door

IN the only way that the discount evil can be cured, by intestinal fortitude on the part of manufacturers who mean it and distributors who also mean it, there are signs that the appliance industry is beginning to take that cure. First one manufacturer has the courage to pull all franchises to distributors and the latter to all his dealers, then another manufacturer feels he can do it too, as long as he is not alone. The courage is catching. Dealers begin to regain confidence that a franchise has value and is worth protecting. Soon the entire tone of the industry improves.

There is no legal way to deal with this problem for even fair trade agreements are only as good as the integrity of the parties to it. With integrity, written contracts are not necessary. It is this type of cure that is longest lasting—a self-discipline that is honorable rather than attempted discipline through fear or law or by intimidation.

The Lid Lifts on Wiring

MAJOR obstacle to the tract builder of homes who would install adequate wiring has been that FHA and VA minimums for wiring set the limit on which banks and lending agencies based their loans. Hence to bring the wiring up to decent adequacy meant adding to the down payment for the extra cost. Marketing of homes on a mass basis could not be done under such a handicap, the builders said.

They were willing to adopt a higher standard for a 100-amp service, etc., and even adopted a voluntary code for it. Now the signs are that FHA under its new administration will accept the industry's recommendations for revised FHA wiring requirements. With these the lenders will put the difference into the mortgage and the million new homes built in 1955 should be far more adequate.

You Can Say That Again

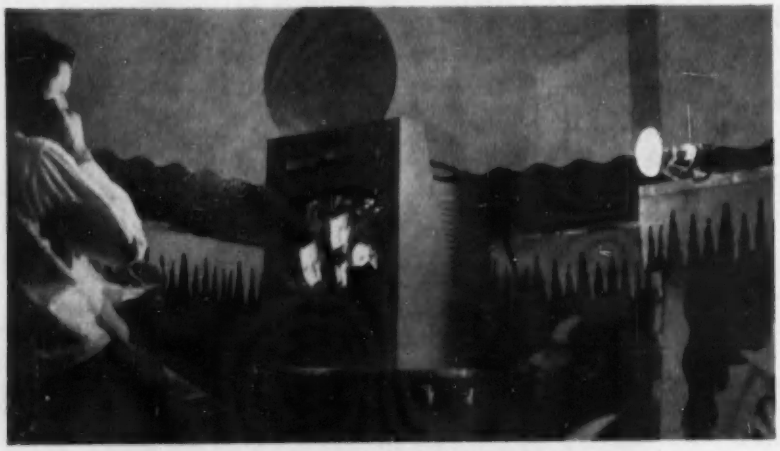
TOMORROW'S "help wanted" advertisement is being written by the research of today. Industry's progress and the employment opportunities it will bring are being determined now in the quiet confines of the laboratory. Research has no end. But if research were ever stopped, we might see the end of a system that has brought this nation to a point where 17 million are employed in manufacturing industries, and more than 60 million in the nation's civilian economy. It is a system that by 1975, assuming no catastrophe intervenes, that can bring 23 million industrial jobs, and a national total of some 80 million. These can be better jobs, with increased purchasing power, shorter working hours, and a higher living standard. But progress is only possible, not inevitable; these new opportunities will not create themselves. They will come into being only if research is expanded to encompass the ever-widening horizon of knowledge, only if industry pours many billions into research and new plants. The sums for expansion can come only if individuals are free to save, if corporations are free to earn a profit commensurate with the risks involved, and if a fair share of earnings can be retained without penalty from taxes that are inequitable. These freedoms must be jealously guarded, for if they are not, we may destroy an economy that has brought plenty to so many millions of Americans—From Dupont's "The Story of Employment Opportunities."

Again some 180,000 San Diegans crowded the selling displays in the four big buildings

Every Time...

San Diego's electric and home appliance shows, put on by the industry itself through its Bureau of Home Appliances, each year keep growing bigger and better. That may no longer be news but it is remarkable. In six days, from Nov. 26 through Dec. 1, it was estimated 185,000 crowded the show in its four large exhibit halls in Balboa Park. Even the city gets into the act, for the Park and Recreation Department and City Electrical Division decorated a Christmas tree lane clear across the park and bridge to the show. With Light's Jubilee just past, Miss San Diego, Jan Golus, who was Miss Diamond Jubilee, was the show queen and hostess too. There was no featured entertainment — just Santa Claus (Charles Cannon, actor) and door prizes afternoon and evening. But it was free, well publicized, and the San Diego public has become accustomed to making the annual show a must-see before doing its Christmas shopping in order to view all brands and makes, see new models and features. Sales during and following the show spurt upward and exhibitors are enthusiastic and return to repeat at each new show the bureau stages. Show committee this year was headed by Bob Redfield of Graybar, with Lee Bornstein, Bob Covell, Bill Kuhn, E. W. Meise, Jim Murphy, Ed Nystrom and George Porter assisting. The real impresario however is J. Clark Chamberlain, secretary-manager, who engineers these annual productions.

Advertising was held until about a week before the show in order to concentrate its impact.



Newest device was Kay Lab's two-way television telephone showing both caller and callee

Ancient electric appliances were shown in contrast with the latest

Santa Claus (Charles Cannon), Miss San Diego, host and hostess

ELECTRICAL WEST

Sales Guide

News Letter

January 1955

FOR THE ELECTRICAL MERCHANT OF THE WEST

If 1954 wasn't so bad, despite discounters, distribution turnover, factory policy shimmies and deals, cooked and uncooked, can 1955 be far behind? 1954 was one of earthquakes and change. But 1955 begins with things seemingly settled down, even if many significant rumblings are going on under the surface. Anything said about them may be challenged or denied, but a newsletter that doesn't stick its neck out isn't worth readying, so here goes--

Shortest commercial

Whether 'tis better to list price or not--that is the big question. G-E broke the custom with its new policy and feels hurt that it has been questioned; denies that it has lost any department stores as reported here on second bounce last month. Conversation on it has died out as dealers wait and see how it works. Meanwhile Thor and Raytheon have issued policy statements declaring such a move "a step backward." Whether it will help or hinder in the fight against discounting is the major argument--and we do not take sides. Time will tell.

Hardly listless

Fair trade laws are in for a battle. In Utah a Federal court declared the state fair trade law unconstitutional and retailers are asking the State Supreme Court to uphold it when the case reaches there. FTC and the U. S. Dept. of Justice are unfriendly to fair trade. Discounters operating either actually or inferring to be union labor buying clubs have been sued by Westinghouse in the S. F. Bay area. Toastmaster has canceled five distributor franchises in southern California. G-E has been rigorously pursuing fair trade violations of its small appliances. S. F. appliance salesmen, victims of discounters, have protested to distributors and asked them to stop letting merchandise get to an AFL discount house. Others suspected of supplying discount houses have been sent anonymous cards. It would appear the war will be hot this year.

The fair and un-

Color TV, which some consider laid an Easter egg in 1954, may only have hatched a chick but it is likely to grow wings toward the end of '55. Hoffman says it will make a 21-in. set even this first quarter. Even Dr. Du Mont has said the quality of the color programs is such people may pay a premium for a color set. Emerson, which drew out of color set making in the fall, said it may have a 21-in. set by April again. RCA's Sarnoff just unveiled an entirely new method to produce color TV by exciting phosphors in a plate. . . Viewers in Los Angeles surveyed by Tele-Census were very lukewarm to color; not anxious to buy.

Chicken next year

All--the detergent--has pulled out of combo sales with appliances. Objections of supermarkets may be the reason.

--or none

"Try to match this--"

Competing with exclusives in this year's models will be--G-E with a a wall cabinet refrigerator to be suspended over the work counter. Also its washer-dryer combination that can be built in waist high. . . Frigidaire with two side-opening french-type doors for its first built-in range and clever fold-down surface units at the rear of a work counter (a new dream kitchen for this year's Motorama is cooking). . . Kelvinator's 16 cu ft, two vertical door, freezer-refrigerator and its removable aluminum foil oven linings for the range. . . Tappan and Raytheon microwave electronic stove due this year. . . Emerson 7½-amp air conditioning unit for room cooling on 15-amp circuits.

Gas attack

The Pacific Northwest may finally get natural gas this year as some of the contesting pipe-line companies came to an agreement. This will mean strong competition for electric cooking, water heating and house heating especially with the appeal of gas being "new" of all things.

Water savers

Drought in the Colorado region this last year brought water using restrictions. The same condition hit Santa Barbara not long back. Both population growth and climatic vagaries can bring such a crisis again in many places. This puts pressure on manufacturers to redesign appliances for minimum use of water. Many new models feature an improvement.

Two in one

To take care of growing air conditioning load Los Angeles Dept. of Water & Power will experiment with a new system of serving with two separate circuits, one for lights, the other power, through a single totalizing meter. Watch for story to come on this ingenious idea.

Sales boost

A quick glance at PG and E's 1955 sales program for northern California shows a boost in promotion on all fronts, special emphasis on adequate wiring, space heating and more of the mass cooking school type of promotions with dealers, in addition to a schedule of monthly drives.

License proposal

Bill to watch is one to be proposed to the California Legislature by Assemblyman William Marsh of Los Angeles, sponsored by the Appliance Profession Assn., designed to have the state set up a Domestic Appliance Contractors' licensing board. It would then require all persons installing, servicing and repairing domestic appliances to be licensed under the state business and professions code.

Farm users

Montana Power and Montana State College have initiated a program to encourage a more extensive and diversified use of electric power in rural Montana, both for the farm home and the farm plant. D. J. McGonigle, Montana Power commercial manager, is on the committee.

Hit twice

A 2% state sales tax is required of subscribers to the community TV antenna system in Casper and Worland because the state public service commission claims jurisdiction over them. It is being protested as an added penalty to those who already have to pay for TV reception that is free to others in the fortunate areas of the state.

Shows bring prospects

TAMA holds its Appliance Festival in the Pima County Fair Grounds, Tucson, Jan. 27-30. Although there is no admission charge, tickets must be secured through banks or participating dealers. Professional talent, displays, prizes are offered. . . More than 1,600 women attended, some 300 were turned away for lack of space, when Columbia Electric & Mfg. Co. and Spokane Norge dealers staged its "Fashions on Parade" style show in Spokane's Masonic Temple Auditorium. Grand prizes were a Norge washer and dryer. Since all women were required to register at the door for free prizes, many prospect leads were secured, according to Frank Porter, Columbia Electric sales manager.

More shows coming

More shows coming up: Western Merchandise Mart Winter Market, San Francisco, Jan. 24-28. Speakers at the big appliance dinner are to be O. R. Doerr, v-p of sales, PG and E, and EEI Sales Section chairman; Harry B. Price Jr., NARDA president; and William H. Gove, v-p of ECM Recordings; Gift and Housewares Show, Feb. 3-6; Third annual Audio Fair, Los Angeles, Alexandria Hotel, Feb. 10-13; California Home Economics Assn.'s fifth biennial convention and exhibit, Los Angeles, Ambassador Hotel, April 2-4; San Diego Bureau of Home Appliances, 11th annual Spring Fair of Modern Home Ideas, Balboa Park, April 22-27; Northern California Electrical Bureau, Electrical Exposition, Oakland, Oct. 1-8.

Win holiday

Among 43 admitted to the Viking "200" club for Norge distributor salesmen were these Westerners: A. J. Dohler, F. B. Connelly Co., Seattle; R. O. Phillips, F. B. Connelly of Oregon, Portland; Ted Conine and Albert J. Nerone, Appliance Appliances Inc., Denver; Daniel Jones, John M. Sues, Lewis W. Johnston, Harry Vacek, Sol M. Weingart, C. J. Askew, Larry Martinsen, Sues, Young & Brown, Los Angeles. Their sales performance won them seven-day holidays in Miami and gold Viking rings.

More top winners

First prize winner in Thor's "Name the Washer" contest was Ted Jessee, Jessee Appliance Co., Santa Ana, Calif. His name for the new line of automatic washers, "Holiday," won $500. In another contest--Motorola's "Big Rose Bowl" competition--top salesman, Mo Nonokowa, Electrical Distributors Ltd., Honolulu, won tickets for the four-day tour of Los Angeles and Pasadena for himself and Sales Manager Ken Grider. Other Western winners in this contest were: Ed Smith, Kierulff & Co., Los Angeles; Bob Kastner, Harry Dooley & Co., Fresno.

Expands

Retirement of Stewart-Warner from manufacture and sale of TV receivers and assumption of its service warranties, parts inventories and most of its distributors by Hoffman was announced. Change of corporate name from Hoffman Radio Corp. to Hoffman Electronics was made to describe company activities more accurately, said President Les Hoffman.

New rep

Audio Marketing Services, a new firm of manufacturers' representatives specializing in hi-fidelity components, will serve southern California, Arizona and Nevada distributors. Mark Markman is sales manager, showroom and office is at 860 N. Vine St., Los Angeles.

Lighting slide rule

Designed to give the right answers automatically and quickly, a home lighting slide rule is offered by G-E Lamp Division through its sales districts at 25¢ each. The lighting recipes appear in a special window; reveal the right lamp and fixture for almost any home seeing situation.

Manufacturer briefs

Hotpoint is offering a four-piece set of direct mail postal cards on servicing for dealers who want to maintain contact with customers after the one-year warranty has expired. . . Kelvinator plans to centralize shipping of all major appliances in Grand Rapids, Mich., to allow dealers to order a mixed carload from a single point. . . Dormeyer Corp. has announced formation of a new division to manufacture and market home workshop and industrial power tools beginning early this year. . . G-E has combined operations of its Clock and Telechron Departments into the Clock and Timer Department; will make the combined line available to both G-E and Telechron distributors. J. J. Burns, who has headed up Telechron on the Pacific Coast, has been named Western head of the combined department. . . Across-the-board retail price increases of $20 per unit have been recommended by Mitchell on eight of its 1955 room air conditioners.

People in the news: Lloyd Dillon, formerly with Hoover, was named district manager, Westinghouse portable appliances, for Colorado, New Mexico and Wyoming, with headquarters in Denver. In the newly created territory of Utah, Idaho and Montana, Robert L. Allen is portable appliance district manager, with headquarters at 263A First Ave., Salt Lake City. He was transferred from Los Angeles. . . Named as manufacturer's reps for Toastmaster water heaters were Mel Pearson, Denver, Joseph Platt, Seattle, O. B. Wilt, Hawaiian Islands, California, Nevada and Arizona. . . Daniel J. Dunn is now sales manager for Roto-Broil in the 11 Western states, working under Irving B. Shurack, Western Division gm. His headquarters are in Vernon, Calif. He was South Pacific district manager for the Westinghouse TV-Radio Division. . . Joseph A. Long, Edison local manager at the Beverly Hills commercial suboffice, was made district manager at Santa Barbara commercial on Jan. 1, replacing Edwin B. Cummings, who retired after 42 years with the company. . . M. A. Hoff, former GESCO branch manager at San Diego, has been named appliance builder representative covering Hotpoint's Los Angeles and San Francisco districts. . . Fred C. Stevenson, for the past six years in Philco's Western regional office at San Francisco, has gone with Whirlpool as manager of its St. Louis territory. . . Parshall Henry, who recently moved to San Francisco from Los Angeles as head of television sales for Leo J. Meyberg Co., has been made a vice-president of the organization. . . Lloyd Starkweather has retired as vice-president and general manager of RCA-Victor Distributing Corp., Los Angeles, after more than 30 years. . . Joseph W. Doan has been made West Coast regional sales manager for Crosley and Bendix.

News of people

Sales and service of Admiral products in the Spokane territory have been taken over by Admiral Distributors Inc., replacing Salisbury Distributors. Herman S. Albert, former Salisbury gm, will have the same post with the new firm. . . Edwards Inc., 531 State St., Salt Lake City, has been appointed Deepfreeze distributor in Utah and parts of Idaho, Nevada, Wyoming and Oregon. Another new Deepfreeze distributor is Radio Television Supply Co., Los Angeles. . . Hoffman Distributors will handle Mitchell room air conditioners in Los Angeles, taking over from Ray Thomas.

Changes

Savage-California Inc., maker of Provincial lamps, has purchased a factory and office building in San Juan Capistrano, Calif., and will move about April 1. . . Corwin Co. of Los Angeles, distributor, will move soon to a building which it has bought at 11th & Figueroa St. and is now remodeling.

Moves

Parts business of Harry Dooley & Co., Fresno appliance, radio and TV distributor, has been taken over by Dunlap Wholesale Radio & Television Supply, a chain with headquarters in Stockton. . . General Appliance Corp. will distribute Proctor toasters in the Salt Lake City area. Claude Guymon is manager. . . David Gray has been made branch manager and Robert Holley general parts and service manager of the new Emerson West Coast Division of Jefferson-Travis Inc. at Fresno, factory branch of Emerson Radio & Phonograph Corp. Emerson West Coast replaced Central Valley Distributing Co. in Fresno and San Joaquin Valley areas.

More changes

Joseph J. Thomas, manager of Densow's Northtown store in Spokane, was named president, succeeding Henry Vincent, Westinghouse Electric Supply; Burr F. James, G-E Supply, vice-president; and Frank A. Tool, Washington Water Power Co., secretary of Inland Empire Electric League for 1955. William A. Lowry, WWP, heads the appliance section; DeVoe Quinton, D. G. Quinton Co., supply and apparatus section and Ed Bergquist, Washington Electric, radio and TV section.

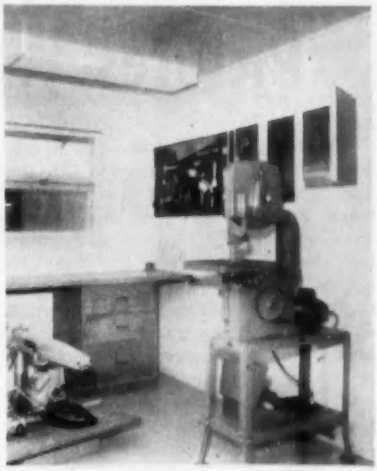
New officers

All-electric kitchen with built-in range, dishwasher, disposal and plenty of appliances

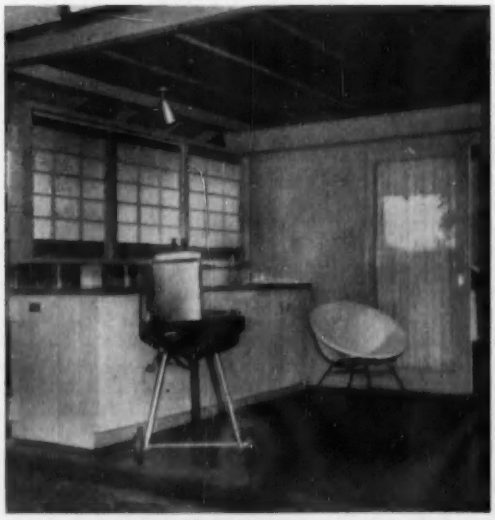
Erma Richards, Terence O'Rouark

Cinderella Never Had It So Good

Called the Cinderella Dream Home, a model home in the Waialae-Kahala new tract on Oahu was truly more than that lady could have imagined. *Honolulu Advertiser* sponsored it, Erma Richards, home economist, and Terence O'Rouark, wiring specialist for Hawaiian Electric Co. made it truly all-electric, well lighted and automatic as possible and it was the big event of Light's Diamond Jubilee in Hawaii. Lighting load of 4.9 kw indoors, 1.4 outdoors, and appliance connected load of 32.5 kw included all the known appliances plus an electric curtain puller and electrically timed sprinkling system. Tommy S. Toma was general contractor; Teruya & Gushiken Electric, contractors. In the month on exhibit 52,693 viewed it.



Hobby workshop and electric control center



Lanai has an electric refrigerator concealed under the counter. Cove and reading spots over bed; drapery is electrically controlled

Real prospects for an appliance had Polaroid picture taken, which dealers honored for a $25 allowance on the appliance when sold

Sixteen shows throughout Arizona, two a week, brought in over 5,000 people, developed over 1,000 pictured prospects for dealers

Pictures Worth a Thousand Prospects

"Your home of tomorrow is Reddy today" was the theme carried through the 16 appliance shows to cover every town in Arizona served by Arizona Public Service Co. Started in September, they ran until Nov. 16, often two shows in different towns a week, Tuesday and Wednesday in one, Friday and Saturday in the next. All equipment and wiring was carried by truck and set up by the company. Local dealers set up displays of their appliances and manned them. L. H. "Bud" Schaff, residential sales manager, organized and toured with the show.

Attractions were cake baking contests, the cakes being auctioned for some local charity or club. In Yuma there were 48 contestants, a few men among them. Sometimes $200 would be realized from the auction. Ruth Kruger, home service director, and her staff members in each division conducted the contest and put on cooking schools. George Hill was host in the northern area, Charles Ekstrom, the southern.

Prospects for an appliance uncovered by a residential salesman were offered a snapshot with a one-minute Polaroid camera. This they could take to any cooperating dealer and apply it for $25 on the appliance of their choice. Public Service Co. paid $10, the distributor $5 and the dealer $10 toward this allowance. The cartoon used in posing prospects said, "You keep the old-fashioned way. She's Reddy for—" and named the appliance. This clever idea produced more than 1,000 appliance prospects for the dealers.

▪ **An auditorium to seat 200** for cooking schools and other similar uses is one of the features to be provided in the new office building that Hilo Electric Co., Hilo, Hawaii, expects to finish by June 20 of 1955. Ted Vierra is the architect, James Oberhausen, electrical engineer, Eugene Urbain air conditioning engineer. The main floor will also contain business offices. The second floor of the two-story building will be set aside for recreation facilities for the employees.

Idaho Forms League

Snake River Valley Electrical Assn. Inc. is the name of a new promotional electrical league formed in southern Idaho and eastern Oregon, with headquarters in Boise at 208 McCarty Bldg. It was officially organized Oct. 25 with a membership of dealers, contractors, distributors and utilities, together with manufacturers representatives.

"We contemplate an aggressive trade promotion program for all segments of our membership, which will expand the market for electrical and electronic merchandise and services as well as strengthen the industry," declares Vic Goertzen, secretary-manager. He names adequate wiring, trade shows, an area-wide cooperative advertising program on retail merchandise, strengthening of the state electrical law and inspection.

Henry H. Falkner, Westinghouse Electric Supply Co., is president; J. T. Jacobson, Harbert Electric, vice-president; James Bruce, Idaho Power Co., secretary; Rankin C. Young, contractor, treasurer. Directors representing dealers are P. A. Powell, Sure Appliance; Leslie Scott, Scott's Locker & Appliance; distributors—Joe I. Wright, Afton-Lemp Electric; William Dyett, Salt Lake Hardware; manufacturers—Paul Worthen, G-E; Joseph Devine, Westinghouse; utilities—R. E. Gale and A. S. Gilbert, Idaho Power Co.

Edison Reactivates

Southern California Edison Co. is reactivating an aggressive continuous sales policy, according to G. N. Hawley, vice-president in charge of the company's commercial operations.

The company in January will institute a program of intensive sales promotion and load-building activities, coupled with full cooperation with manufacturers, distributors and dealers. Work also will be stepped up with architects, builders and contractors. Adequate wiring promotional efforts will be heavily accented.

One of the new features of Edison's sales program is the attention that is being focused on tract builders, who will build thousands of homes in Edison territory this year. In addition to encouraging these groups to construct tracts of all-electric homes or to include major electric appliances in the houses, the company will provide builders with technical and promotional assistance.

G-E Starts Mix or Match Color Program

Introduction of its "mix or match color choice" program was a feature of General Electric's 1955 major appliance dealer previews held throughout the West during December.

Also unwrapped by factory representatives were the new white lines, with some items featuring color trim or interiors and with enough models to give the customer plenty of choice. Each factory man gave the sales story and told of dealer aids.

Typical of these meetings was the one in Oakland's Leamington Hotel the week of Dec. 6. Hosts were Gordon H. Smith, G-E Appliance Division district manager; Robert A. McWhinney, sales manager, and R. LaPado, sales promotion manager, Major Appliance Division, G-E Supply Co., in this area.

In presenting the color line, McWhinney said that the G-E program is long range, with a merchandising plan to go along with it. Each dealer can set his own pace, he explained, because the company intends to proceed as demand grows; will not rush dealers or load them down with inventory. A color appliance in a window or on a display floor can serve as a conversation piece, he reminded, and color will hasten obsolescence. Consumer surveys now indicate that more than 50% want color in major appliances as compared with only 5% a few years ago, McWhinney said.

For customers who want to redo an entire kitchen, paint stores will have colors matching the appliances — canary yellow, turquoise, pink, cadet blue, wood tone brown. Satin white takes its place as the sixth color.

A few of the new things:

Freezer trays in which food can be frozen in minutes and put in the package later; flood-lighted refrigerator interiors with cove lighting, permitting the user to see down into the vegetable compartment; a combination refrigerator-freezer with bottom freezer compartment; medium-priced refrigerator with revolving shelves.

A completely automatic combination washer-dryer available in both free standing and under-counter models, with a Filter-Flo washing system that cleans and recleans water during the washing cycle and gives greater clothes capacity.

An automatic Calrod surface unit with three zones, warm, boil and fry; a built-in range, yellow or stainless steel, with push-button switches that can be mounted on front, side or back, large oven, porcelain interior.

Cute petite "Happy Hotpoint" directed the show for Hotpointers J. F. McDaniel, vice-president of Marketing, Roy Kimberlin, Graybar manager, Harry Gerster, G-E Supply Western vice-president, Howard Scaife, Hotpoint sales manager, at distributors' meeting

Hotpoint's Happy and Golden

Commemorating its 50th anniversary, Hotpoint Co. has named its selling program for this year its Golden Anniversary Program, John F. McDaniel, vice-president, marketing, told the San Francisco meeting of its Western distributors from 11 states, Dec. 21. McDaniel, Howard Scaife, sales manager, and a group of top product managers came West to put on a big distributors show as the last of four such regional meetings. The full program will be transmitted by these distributors to dealer meetings in January and the big push will begin in May and June, spearheaded by a big consumer contest.

This essay contest for $2,000,000 in prizes will start May 1. It is called Hotpoint Living-Conditioned Golden Anniversary Homes contest. Top prize in each of four geographical areas will be a complete home. Other prizes include 50 kitchens and 5,000 appliances. The Western house is to be one designed by Donn Emmons, AIA, San Francisco.

With big show flare all of Hotpoint's new 1955 Golden Anniversary appliances were shown and their features dramatized. The familiar Hotpoint red man came to life in new form as Happy Hotpoint, played by a diminutive Miss with lots of personality who was master of ceremonies for the show.

Two outstanding new features were color trim and built-ins. Not only are the range oven and surface burners made in built-in models but so is a two-door refrigerator-freezer and an automatic dishwasher. And the surface units include provision for the plug-in French fryer and surface griddle. The dishwasher is designed for undercounter installation where a custom made kitchen is wanted.

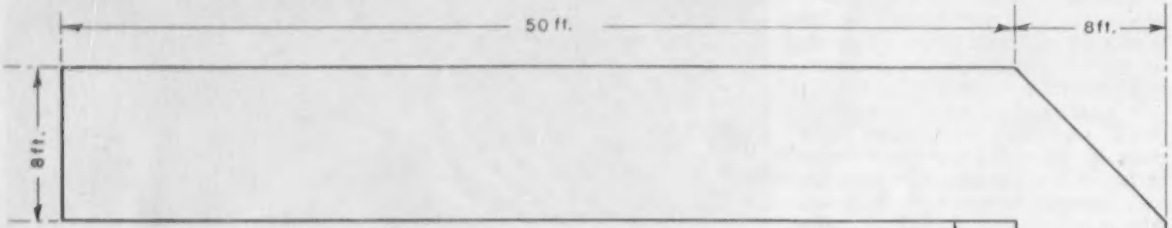
Other firsts include a still faster Calrod cooking unit said to outperform gas by 22%. Likewise push-button controls have been applied to washers, dryers, air conditioners.

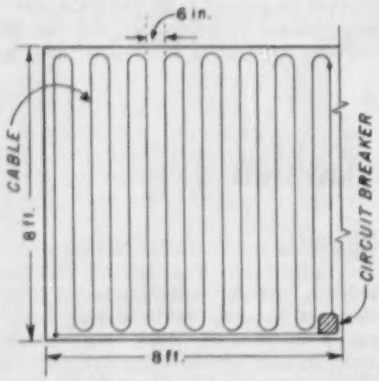
• **Las Vegas, Nev.'s hard pressed utility,** Southern Nevada Power Co., is rushing to completion a new steam plant to take care of the tremendous growth in load there, not the least of it being for electric heating. Since June 1952 there have been 1,872 jobs installed with the Wesix load regulators that takes the load off the peak by dropping the voltage to 120 from 240. According to A. P. Gibson, distribution engineer, this has helped although the jobs are not so located as to make a real test. On cold nights the company's peak jumps from a normal of 45 mva to 70 and on Nov. 29 to 101 mva. Summer peak with air conditioning is only 50 mva, because most cooling is evaporative. This gives a rough idea of the problem.

NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION

Utilization Data Sheet No. 94

SUBJECT: Use of Heating Cable on Marquee
CUSTOMER: Wilma Theater, Coeur d'Alene, Idaho
TYPE OF BUSINESS: Movie Theater
SERVICE COMPANY: Washington Water Power Co.
DATA SHEET PREPARED BY: A. C. Needham





Above: Plan view of theater marquee where heating cable was installed for melting snow. At left: Cable arrangement provides 125 w per sq ft

Disposal of snow on the marquee of the Wilma Theater at Coeur d'Alene, Idaho, was a problem. The construction made it difficult and hazardous for a workman to remove snow in the conventional way. In fact, the 6-ft-high glass columns of the marquee made it almost impossible to shovel the snow.

Solution — Eleven pieces, each 120 ft long, of G-E No. 19 lead heating cable was laid on approximately 12-in. centers on the marquee, providing approximately 125 w per sq ft. Each section, rated at 800 w, 240 v, is served from eight 40-amp circuit breakers. A red pilot or indicator light shows when the cable is in operation.

H. Stewart, Coeur d'Alene manager for the Dream Theater Corp., is well satisfied with the installation. He reports that he has found it safe, trouble-free and convenient. The saving in labor and in the cost of snow removal is the greatest asset.

This corporation has two other theaters in the city with smaller marquees. During the past winter one snow removal cost $40 at each theater.

The heating cable was used approximately 10 hours during the season. Since the connected load is 8.8 kw, 88 kwh were used. In this instance the rate was 1c per kwh. Cost of operation was 88c. Demand was not affected as the cable was used during hours the theater was not in operation.

Electric heating cable on marquee eliminates $40 snow shoveling job at Idaho theater

Solving load problems as more homes "go electric"

The past decade has seen utilities match the nation's tremendous housing expansion with corresponding system growth.

As more homes "go electric," the future points to increasing loads on these lines. On the following eleven pages, Mr. F. D. "Whitey" Hurd, Westinghouse Consulting and Application Engineer, and product experts discuss some specific ways you can meet this trend—on a practical basis.

On the next page, the Meter Division leads off with news about the new meter socket . . .

YOU CAN BE SURE...IF IT'S

Westinghouse

Note how the bus-type terminals easily accommodate heavy conductors. Terminals swivel in an arc, thus reducing wire bending to a minimum.

New meter socket wires easily with up to #0 conductors

Heavy conductors up to #0 are no problem with the new Westinghouse die-cast aluminum meter socket. Wiring is simplified because of the new bus-type terminals. These terminals swivel for easy alignment with the conductors. On installations using heavy conductors, the tops of the terminals may be removed, conductors simply dropped into place, and the tops replaced. Smaller wires may be inserted into the terminals without removing the tops.

The socket has outside hubs to give more room inside for wiring. Terminals have large contact surfaces with "follow" action, insuring a solid connection on aluminum or copper conductors. All sockets have a breakout in the back for use when three-point mounting is required.

A new sealing ring which can be installed without tools is supplied with this socket. Since the socket, ring and meter rim are all iridited-aluminum, no electrolytic corrosion can take place.

The socket is available for either single or polyphase service with two or three outlets, in 1-inch, 1¼-inch and 1½-inch hub sizes. For more information, write for booklet B-6377, which contains the complete story about this socket.

YOU CAN BE **SURE**...IF IT'S

New secondary capacitors: 40% lighter, easier to handle

As they "power up" for modern living, America's homeowners are buying over a million air conditioning units a year. That looks good on load growth charts—but what about power factor?

The new Westinghouse 3 and 5-kvar secondary capacitors are the answer. They're inexpensive, light, easy to handle and completely flexible. They'll enable you to boost power factor on heavily loaded secondaries *at lower cost per kilovar than ever before.*

These new secondary capacitors offer you an exclusive cost-reducing design feature: tubular cases of 16-gauge extruded aluminum. They weigh only 16 and 25 pounds respectively—*40% less than comparable units.* A lineman can carry them up a pole and install them in a matter of minutes. They will never corrode —never need painting.

These capacitors can be mounted with bushings up or down—bolted directly to the pole or mounted on the crossarm with a standard EEI-NEMA bracket. Leads are furnished and, when required, external bushing-mounted indicating fuses can be supplied.

The use of secondary capacitors can be readily justified. You can prove this for your system by following the simple procedure outlined in a technical paper, *Application of Secondary Capacitors on Overhead Systems* by Hamilton Brooks. Write for it today.

Hamilton Brooks, Supervisory Engineer, Capacitor Section, with the new 3 and 5-kvar capacitors. Designed for use with 7½ and 15-kva transformers, the capacitors usually are placed about two-thirds of the distance from the transformer to the end of the line.

Austin Fink of the Switchgear Distribution Apparatus Department points out, on the next page, important economies for residential distribution lines.

Westinghouse

Austin Fink, Manager of Recloser, Cutout and Fuse Engineering, shows the standard 5.2-kv enclosed cutout box with its seven interchangeable doors.

Enclosed cutout interchangeability reduces distribution costs

One porcelain box—seven interchangeable doors! That's what you get with Westinghouse enclosed fuse cutouts—and it means a lot to you in the face of rapidly rising residential loads.

It means you don't have to change the entire cutout when fault or load current exceeds the rating of your present standard cutout. All you have to do is replace the door. It saves labor out on the line. Reduces inventory, too—for change of ratings, only the doors need to be stocked, not the boxes.

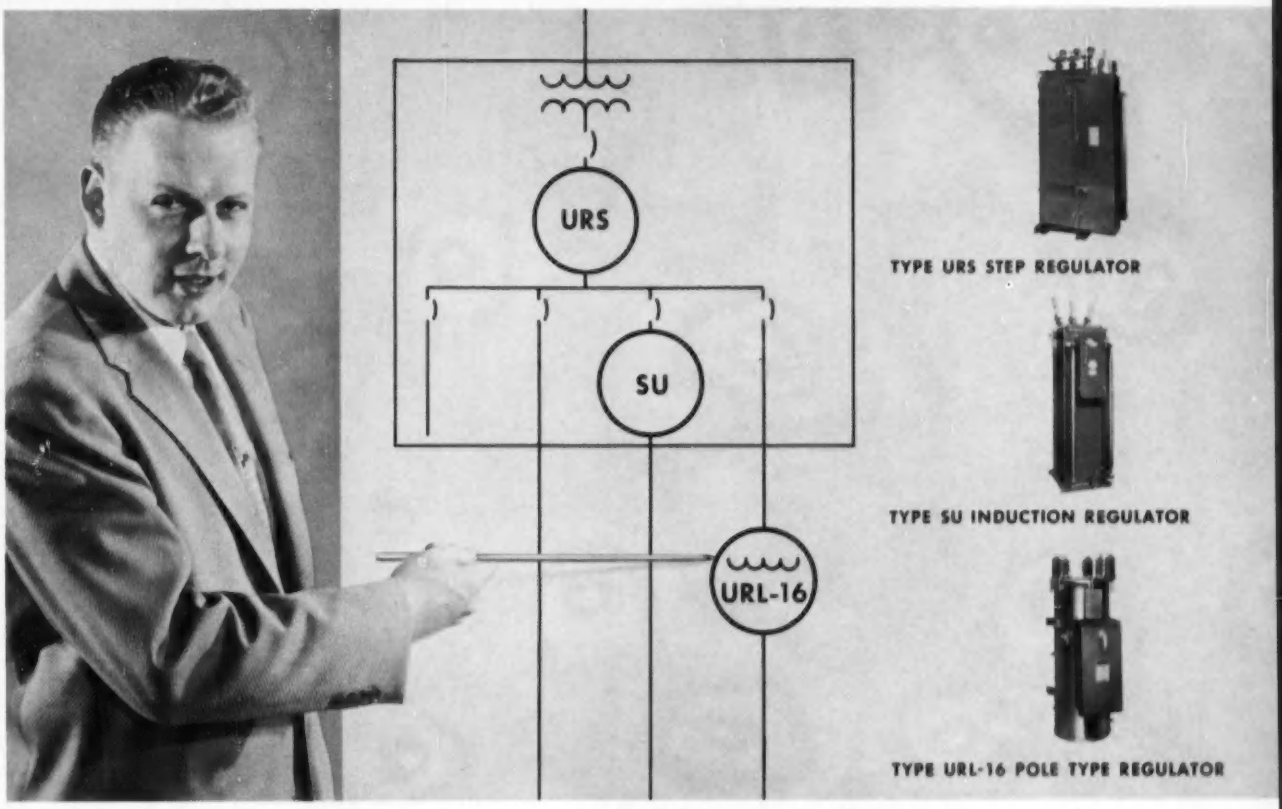
For 5.2-kv service, there are three ratings for one box: EA-50, the standard 50-amp, 1200-amp I.C. cutout . . . HC-50, a high-capacity 50-amp, 5000-8000 amp I.C. cutout . . . MC-100, a new 100-amp, 5000-8000 amp I.C. cutout. These three ratings are available in both dropout and non-dropout types. And there's a 100-amp disconnect blade. *Seven interchangeable doors—one porcelain box.* Equivalent number of ratings available for 7.8-kv service.

You can count on these additional benefits with Westinghouse enclosed cutouts: Exclusive Prestite® porcelain process insures proper fit of doors. Fewer joints in the current path mean less heating, less corrosion and longer life. On dropouts, the door swings through 180° for greater visibility and safety.

Complete facts are in DB 38-610. Write for it.

YOU CAN BE **SURE**...IF IT'S

On the line or in the substation . . . these regulators cut costs, improve service



Al Cleveland, Regulator Sales Engineer, with a single line diagram showing regulator applications.

The complete line of Westinghouse regulators makes it possible for you to apply either step or induction types to meet specific requirements throughout your distribution system.

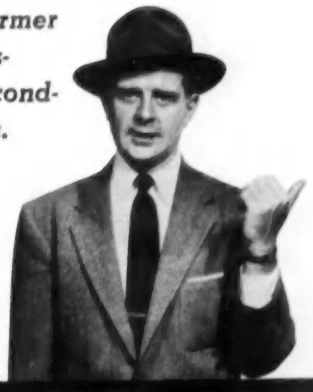
Very important in meeting growing loads is the URL-16—pole-type step regulator. This advanced 16-step regulator with its exclusive "inverse integrating" voltage regulating relay assures you *the closest effective bandwidth possible in any step-type regulator.* And it does it with fewer operations and simpler construction—for long contact life and minimum maintenance.

For station regulation, the SU induction regulator has proved its superiority with pin-point accuracy and absolutely minimum maintenance. SU "all-electric" control assures Class 1 accuracy and eliminates mechanical control adjustments. Just turn knobs on the convenient control panel.

Also for station regulation, the all-new URS is the most accurate, most compact, station-type step regulator you can install. A lifetime Class 1 "all-electric" control and separately compartmented, easily accessible tap-changer contacts are just two of the many features you should investigate if your load problems require the best station regulation.

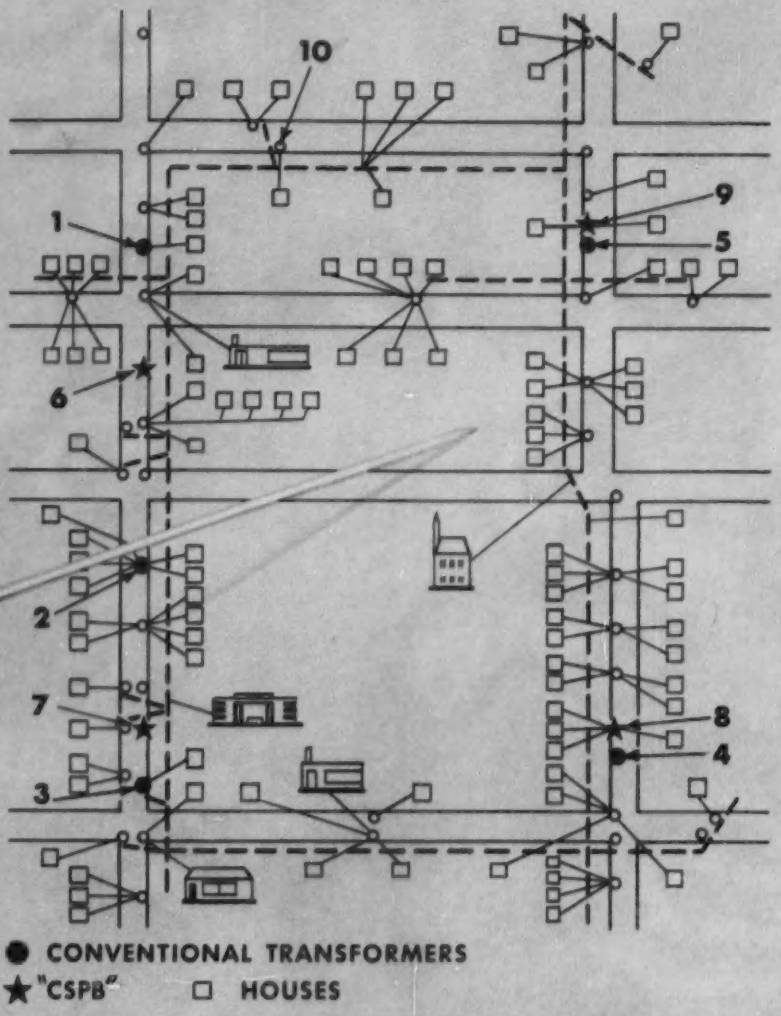
In fact, wherever you want the best regulators, at no extra cost—to meet your specific load requirements—look to the complete Westinghouse line. Booklet B-6053 with complete product details and application data is available from your local Westinghouse representative.

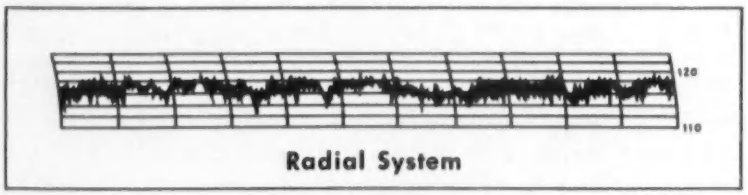
On the next two pages Bob McCollom of the Transformer Division talks about transformers and banked secondaries in residential areas.

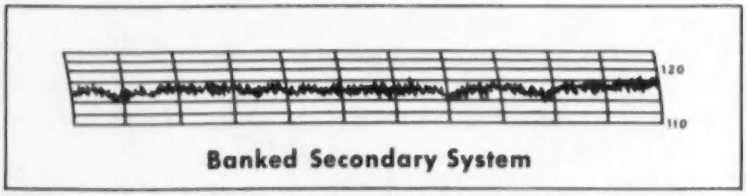


Westinghouse

LOCATIONS OF TRANSFORMERS
(CONVENTIONAL AND "CSPB")







R. N. McCollom, Sales Manager, Transformer Division, points out utility test area with conventional transformers at locations 1, 2, 3, 4 and 5. These were replaced with "CSPB" transformers at 6, 7, 8 and 9. Instantaneous voltage dips at location 10 were recorded before and after "CSPB" transformers were installed. A 45% reduction was achieved.

BY ACTUAL TEST,

"CSPB"® transformers provide for load growth . . . improve regulation at lower cost

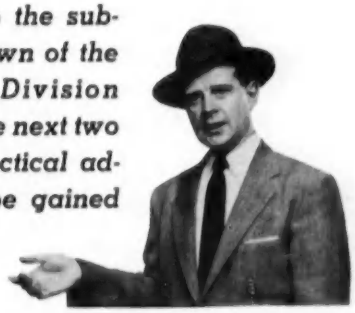
Actual tests conducted on well-defined load areas have proved the inherent superiority of the "CSPB" banked secondary system in handling growing residential loads . . . while improving voltage conditions at less cost.

The test area selected had five conventional transformers totaling 55 kva, serving 106 residential and five commercial customers. A survey of major appliances in use indicated that considerable load growth could be anticipated. Existing load and voltage conditions were recorded over a period of two months.

Following this, the five conventional transformers were replaced by four 15-kva "CSPB" units. Again, load and voltage conditions were recorded over a period of five months. The findings are tabulated in the load data table, below.

The result? Average voltage conditions were improved by 7% . . . with far less capacity than would have been required to make the existing radial system adequate. In addition, all of the benefits of "CSPB" construction were realized. For further information, write for booklet B-4310A which contains complete data for your application.

Moving back to the substation, Roy Brown of the Transformer Division points out, on the next two pages, how practical advantages can be gained there, too.



YOU CAN BE **SURE**... IF IT'S **Westinghouse**

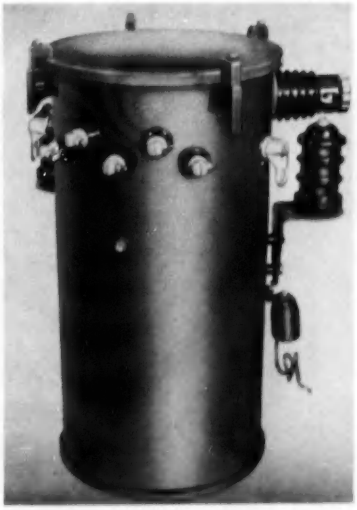
FOR RADIAL SYSTEM

Transformer No.	Kva Rating	Individual Load Peaks Kva	%	Transformer Loads at Time of Peak Load for System Kva	%
1	7½	11.04	147	8.40	112
2	10	12.96	130	11.52	115
3	7½	18.72	249	8.40	112
4	15	18.00	120	14.64	98
5	15	18.00	120	17.28	115
Tot. 5	55	78.72	147	60.24	110

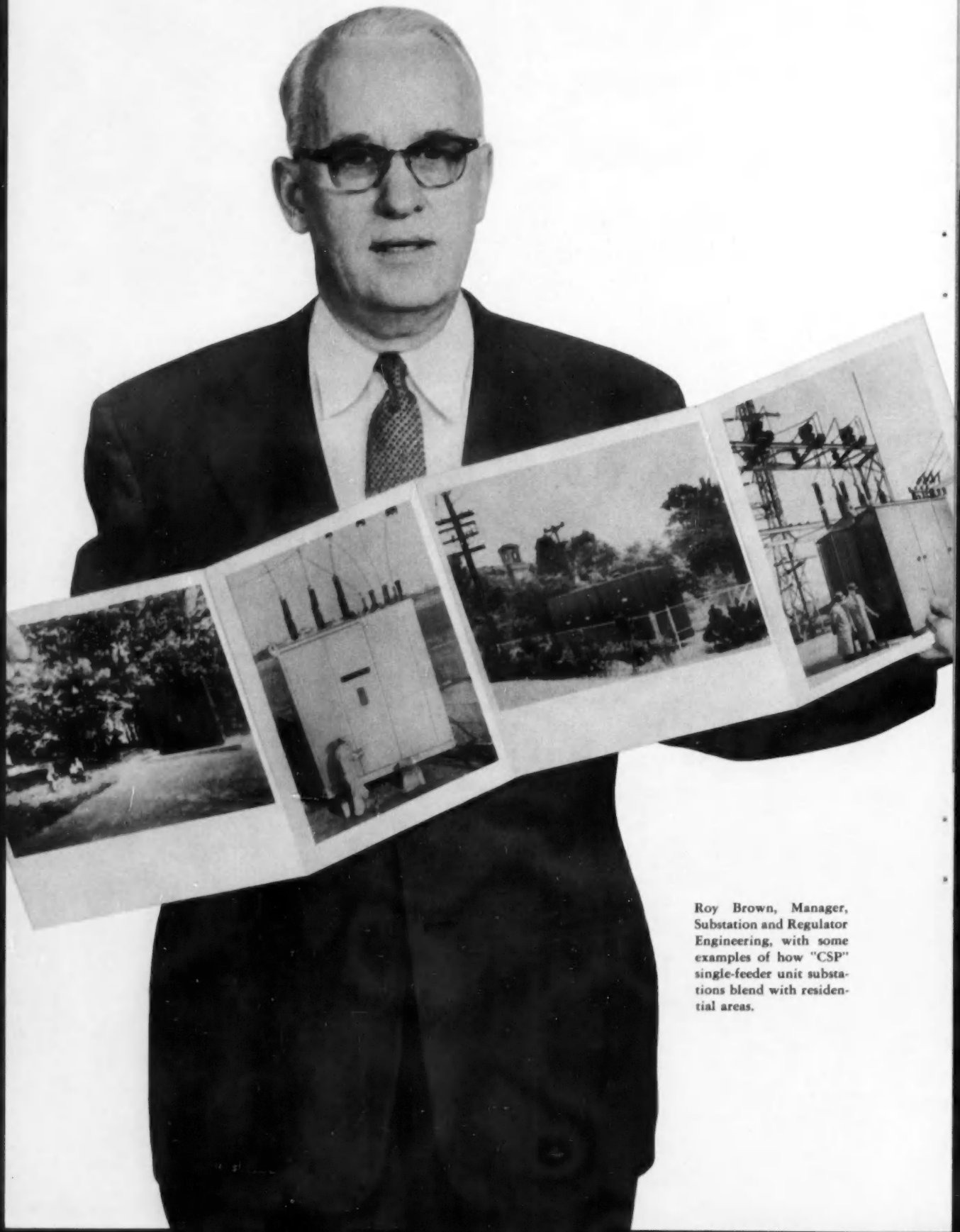
FOR "CSPB" BANKED SECONDARY SYSTEM

Transformer No.	Kva Rating	Individual Load Peaks Kva	%	Transformer Loads at Time of Peak Load for System Kva	%
1	15	17.28	115	14.88	99
2	15	17.76	118	17.28	115
3	15	15.84	105	15.84	106
4	15	15.84	105	14.40	96
Tot. 4	60	66.72	111	62.40	104

Peak load data table shows more uniform load distribution in banked secondary system. Same load growth on radial system would have required much more than the 5 kva added with "CSPB" transformers.



"CSPB" distribution transformer for banked secondary system has built-in lightning, short circuit and overload protection. A system of "CSPB" transformers cannot cascade.



Roy Brown, Manager, Substation and Regulator Engineering, with some examples of how "CSP" single-feeder unit substations blend with residential areas.

Flexible substation . . . makes a good neighbor

For single-feeder substations—in residential areas—the Westinghouse "CSP"® power transformer is a logical choice because of these significant points:

Residential Acceptance — Because the "CSP" power transformer is compact, attractive, quiet and safe, it makes a good residential area "neighbor". You can locate substations to achieve best system efficiency—with less likelihood of objections arising from residential or commercial restrictions.

Factory Coordination—You place a single order and get in one compact unit, a complete single-feeder substation with the 43 components of a conventional substation built in, coordinated and tested at the factory. You eliminate all the time-consuming shipping, expediting and installation coordination necessary with conventional substations.

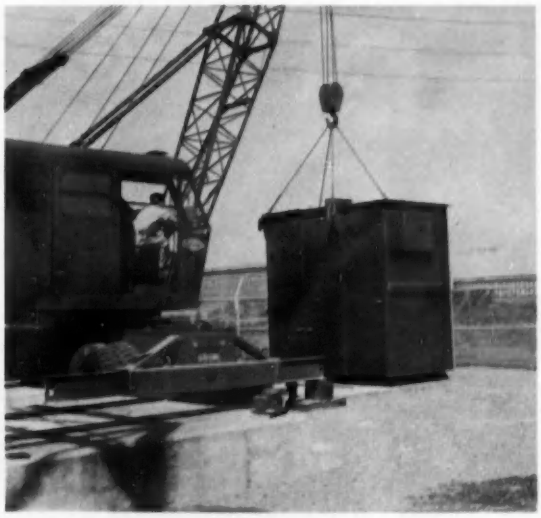
Simplified Installation—The "CSP" power transformer requires a minimum of real estate . . . and only one foundation. Unload it—tie in transmission and feeder lines and it's ready to go—with complete lightning, surge and fault protection, automatic voltage regulation, load switching and metering. Site-erected substation installation time is reduced 4 to 1. Landscaping is made easy.

When loads are increasing, additional "CSP" power transformers can be easily added. When loads shift, they can be easily and economically moved—with full salvage value. Booklet B-4692 includes still more advantages. Write for it.

On the next two pages Herman Barsun of the Transformer Division discusses substation regulation in relation to your residential load problem.

YOU CAN BE **SURE**... IF IT'S

Westinghouse



Installing a "CSP" single-feeder substation is a simple process because it is delivered *complete* in one shipment. Unload it—tie in transmission and feeder lines—and it's ready to go.

Herman Barsun, Section Manager, Regulator Section, Transformer Engineering, exhibits the compact orderly construction of the new URS load tap changer.

Consumer satisfaction demands accurate substation regulation

Well-regulated utilization voltage at your customer's service entrance depends on accurate and reliable regulation at the substation level. Whether you are considering "CSP" power transformers, unit substations or standardized power transformers, the URS load tap changer assures you not only accurate and dependable voltage regulation but *quiet* operation as well.

Contributing to both quiet and dependable operation, the Geneva gear drive is the heart of the URS operating mechanism. Contacts move at the optimum speed to prevent burning, yet are accelerated and decelerated smoothly for shockless operation.

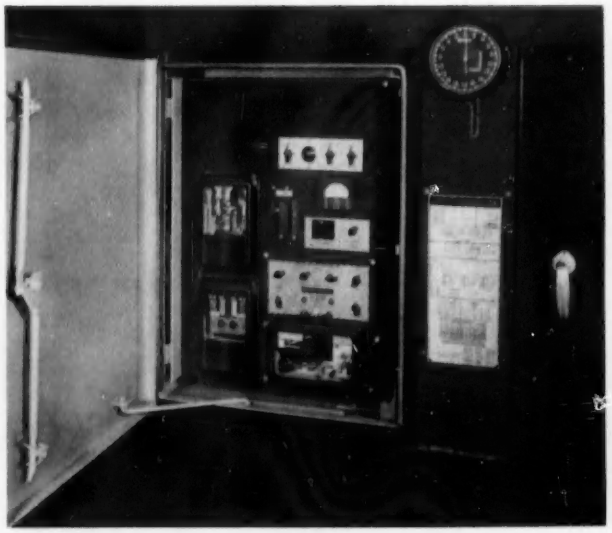
You will also appreciate the improved appearance of the new URS housing. The control cabinet is an integral part of the tap changer, resulting in minimum size and weight. All control devices are mounted on a hinged steel panel assuring maximum convenience for operation and maintenance.

The control cabinet contains the new SJS voltage regulating relay. Simple, dial-operated, all-electric settings eliminate mechanical adjustment devices. Hinge-spring construction eliminates pivots and bearings. Factory sealed—not even contact dressing is needed.

Your local Westinghouse representative will be glad to discuss further details of the new URS load tap changer with you.

YOU CAN BE **SURE**...IF IT'S

Westinghouse



Hinge-mounted for easy accessibility, the integral control panel includes SJS voltage regulating relay, time delay relay, motor control relay, and manual control provisions. Operation and maintenance are simplified.

Complete SJS voltage regulating relay is mounted with four bolts and wired through plug-type connectors for ease of routine testing. All-electric settings eliminate mechanical adjustment devices.

D. N. Reps of Electric Utility Industry Engineering worked out the hypothetical equivalent system that solved this particular problem.

"Equivalent systems" analysis solves feeder-voltage problems

"A medium-sized city in the midwest faced a problem that is becoming increasingly common as more homes 'go electric'.

"It was apparent that the present 2400-volt feeders would soon be overloaded, and the utility was concerned about regulation and outages that could result in loss of goodwill, as well as revenue.

"Together with the utility engineers, we went over the problem in detail, even surveying the area to determine geographical and physical factors. Armed with this information, we took the problem to the Distribution Engineers at East Pittsburgh for solution by the unique method of constructing a hypothetical equivalent system. Thus, comparable voltage levels and substation ratings could be checked, yielding results applicable to the actual system.

"The results of this study clearly showed that optimum economic design could be achieved by changing over to 4160 volts. The utility is now in the process of making the change-over . . . ample proof that they were pleased with the study."

These and many other facilities, backed up with broad Westinghouse experience, are available to you, around the clock. For any generating, transmission or distribution problems you might encounter, resources like these are priceless. CP-1022-A

For additional information or literature on any of the products discussed on the preceding pages, contact your local Westinghouse representative, or write direct to Westinghouse Electric Corporation, 3 Gateway Center, P.O. Box 868, Pittsburgh 30, Pa.

YOU CAN BE **SURE**...IF IT'S Westinghouse

Old-Timers Feted;

Other Association News

Fifty old-timers in the electrical industry in San Diego were honored in connection with Light's Diamond Jubilee in a special dinner sponsored by the Electrical Contractors of San Diego, division of the Bureau of Home Appliances. J. L. Zwiener, electrical contractor, presided. There were more than 70 electrical contractors present. Manufacturers' agents and distributors put in displays on table tops, 35 in all, of new and interesting products in the House of Hospitality Arcade. Speakers were Edmund T. Price, president, Solar Aircraft Co., son of an Edison pioneer, and L. M. Klauber, former president, San Diego Gas & Electric Co., who told of the future use of "Atomic Energy for the Generation of Electricity."

Inspectors

Electrical Inspectors' Association of British Columbia discussed the running of conductors in multiple at its Nov. 8 meeting. Questions also arose regarding the derating of cables and Provincial Inspector Ryan said this is being considered by a special committee set up to investigate thoroughly the current carrying capacities of wire. A report on aluminum sheath cable was to be given at the Dec. 13 meeting.

Northern California Chapter, International Association of Electrical Inspectors, will hold its Jan. 15 meeting at the new Underwriters' Laboratories building at Santa Clara and Central California and Sacramento Valley Chapters have been invited as guests to tour the new laboratory facilities. (See p 61, this issue.)

Southwestern Section, IAEI, may have to change the place of its annual meeting next Sept. 19, 20 and 21 from Arrowhead Springs Hotel. The hotel has been closed indefinitely. Other accommodations may later be obtained at the Mission Inn, Riverside, however, L. E. La Fehr, secretary, announced.

Puget Sound Chapter, IAEI, at its last quarterly meeting, Dec. 10, at Everett, engaged in a lively discussion of the grounding of portable tools and even appliances. Need for an adequate ground at the temporary service panel itself if the third wire in the tool cable is used, was pointed out. The neutral is unsafe to use because of possible reversal of connections. Equipment grounds where there is too high a resistance could be hazardous too. The chapter voted to recommend to the Northwest Section that a requirement for grounding-type receptacles be carried forward. Another concern expressed was that one make of dryer will be brought out soon and will have a 9.5 kw rating. With such appliances as these dryers, high-recovery water heaters and house heating reconsideration of diversity factors for services was recommended. In the election of officers E. M. Tubbs, city electrical inspector, Bellingham, was named chairman; E. L. Disney, Bremerton inspector, vice-chairman; C. S. Alger, Puget Sound Power & Light Co., secretary, and H. L. Holcombe, Olympia inspector, treasurer. The executive committeemen are J. M. Girard. Hoquiam; T. M. Widrig, Trumbull Division G-E; and J. D. Gawne, Seattle City Light. Next meeting will be on March 4 at Bellingham.

Preparing for Los Angeles next IES regional conference: standing — Roy Jones, Jack Russell, Jake Hochenauer, Lloyd Reuscher, Del Reynolds; seated—Merle Potter, Mrs. Roy Kreyser, Jack Rehring, chairman, W. P. Bear and Hugh Sheeter. Dates: April 14-15

EMEA

An electrical maintenance conference instead of a show will be the major activity of the Electrical Maintenance Engineers Assn. of Southern California in 1955. The theme will be "Practical Electrical Maintenance." Place will be University of Southern California, Los Angeles; dates April 5, 6 and 7. H. F. McCullough, general manager, service shops department, General Electric Co., New York City, will be the featured speaker at the kickoff banquet April 5. He will stress the importance of maintenance to industry, illustrating with statistics of projected future maintenance expenditures. Some electrical exhibits will be made by manufacturers at this banquet. Conference panel forums begin April 6 with such subjects as: economics of planned preventive maintenance, maintenance of electronic equipment, of electrical equipment in industry, electrical and safety codes as they affect the maintenance department, special instruments, tools and methods used in maintenance, and maintenance of electrical equipment in small plants, employing fewer than five electricians.

At its Dec. 15 meeting, the organization heard Mike Wintz, senior electrical inspector of Los Angeles City, discuss the prospective new electrical code.

IES

Arizona Chapter is now a section. The Arizona group raised the status of the Illuminating Engineering Society chapter to that of a section, it was announced last month in Phoenix. Ray Jones, Newbery Electric Corp., is its chairman; Bevan Jones, Arizona Public Service, vice-chairman; John Gohring, J. E. Redmond Supply Co., is secretary. By becoming a section, two new members were added to the board at that meeting. They were Paul Young and Jerry Whitnell. Action was also taken to nominate Jerry Whitnell for the next term of regional vice-president for the Rocky Mountain region. Whitnell is busy organizing the program and arrangements for the Rocky Mountain regional meeting in Phoenix April 13. H. L. Cox of Motorola described the special lighting effect at Joaquin Miller Park in Oakland to the same meeting.

Southern California Chapter is preparing for the Ninth South Pacific Regional Technical Conference in Los Angeles, April 13-15, at the Statler Hotel. General chairman is F. Jack Rohring, Southern California Edison Co., who has appointed the

R. W. Racine, B. C. Electric, past chairman, and W. J. Lind, Lamp Division, CG-E, past regional vice-president of IES, presented appreciation certificates by T. Doherty

following committee: vice-chairman, Merle A. Potter; attendance, J. M. Russell; budget, William Shalda; entertainment, Lloyd C. Reuscher; finance, G. A. Hochenauer; hotel, Hugh X. Sheeter; ladies entertainment, Mrs. Roy H. Kreyser; papers and program, Roy Jones; publicity, Del Reynolds; registration, William P. "Teddy" Bear; properties, Charles Connely; transportation, Benn J. Hartmann.

Northern California Section ended its evening course in practical illumination Dec. 16. Begun Oct. 5, a series of 10 classes was held in each of Oakland, San Francisco and Fresno on successive Tuesday, Wednesday and Thursday evenings. The course was designed for architects, contractors, fixture designers, interior decorators, building owners and managers, maintenance engineers, manufacturers' and wholesalers' salesmen and carried a $12 fee, which included copies of the IES recommended practices. John S. Walsh, Pacific Gas and Electric Co., was chairman and Milton C. Very vice-chairman, with Ray P. Benton in charge of Oakland, Frank E. Duhme San Francisco and J. E. Hammond of the Fresno group of meetings. Attendance was excellent throughout the series in each of the three places and the course was considered a success in every respect.

Oregon Section pondered the question "Why don't we measure up with the plumber, carpenter and the painter?" at its Dec. 8 meeting. Marvin Prestwood, Portland GE, was moderator and the panel considering the question consisted of Donald W. Edmundson, architect, Coe C. White, consulting engineer, Glen H. Emory, contractor, George H. Smith, G-E Supply Co.

British Columbia Section heard John D. Harrison, vice-president in charge of sales, Holophane Co. Ltd., discuss the depreciation of lighting equipment in a talk entitled "Let's Stop Kidding Ourselves" at its Nov. 18 meeting. Design of lighting, based on most utilization tables, often do not take into account floor reflection factors where good reflections of 20 to 30% may be present. In other cases objects in the room intercept light reducing the results. Maintenance factors of 70% may not be enough to compensate for dust, dirt, voltage drop, lamp depreciation and burnt out lamps, he cautioned. R. G. Scott, B. C. Electric, outlined good design practices in street lighting. If reflection factors of street surfaces could be increased he pointed out effectiveness of street lighting could be more than doubled.

San Diego Chapter had a demonstration of "application of electrical equipment in hazardous locations" at its Dec. 21 meeting. H. E. Riggs, regional manager and R. B. Johnson, products engineer of Crouse-Hinds Co., explained construction of explosion proof lighting equipment and demonstrated with actual explosions in electrical fixtures. The meeting was held jointly with the American Institute of Electrical Engineers.

Electric Clubs

San Diego Electric Club held a special meeting jointly with the AIEE, ASME, Electrical Contractors of San Diego and IES Dec. 16 to hear Dr. Harry K. Ihrig, vice-president in charge of research, Allis-Chalmers Co. who discussed "The Magic of Metals." At the previous Dec. 9 meeting Floyd L. Goss, Los Angeles Department of Water and Power, discussed "The Electric System of Great Britain, Its Problems of Operation." Goss was one of the engineers selected by the State Department to serve on a technical committee to make recommendations to the British Grid. San Diego Electric Club notes greatly increased interest and attendance since it has moved its meetings to the Hospitality House in Balboa Park.

San Francisco Electric Club heard a review of Pacific Gas and Electric Co. construction in the first postwar decade and its plans for the second decade given by Walter Dreyer, vice-president and chief engineer, at its Dec. 6 meeting. At the Nov. 29 meeting a new PG and E moving picture, "At Your Command," was shown as a premiere. At the Dec. 13 meeting E. Finley Cutter, manager of research operations, Stanford Research Institute and former vice-president of engineering for Sylvania Electric Products, talked on "The Human Side of Engineering."

NECA

Santa Clara-San Benito Chapter of National Electrical Contractors Assn. elected Joe Santora Jr. as its president for the new year, Dec. 6, according to G. A. Harter, manager. Howard Millard is vice-president and Paul Leslie is secretary-treasurer. Ray Rosendin, past president, was elected governor to succeed Irving Butcher. The official installation was made at a dinner dance Dec. 17, at which time a one-act burlesque picturing the experiences of an ill-fated estimator was put on by Ray Rosendin with a cast of five members.

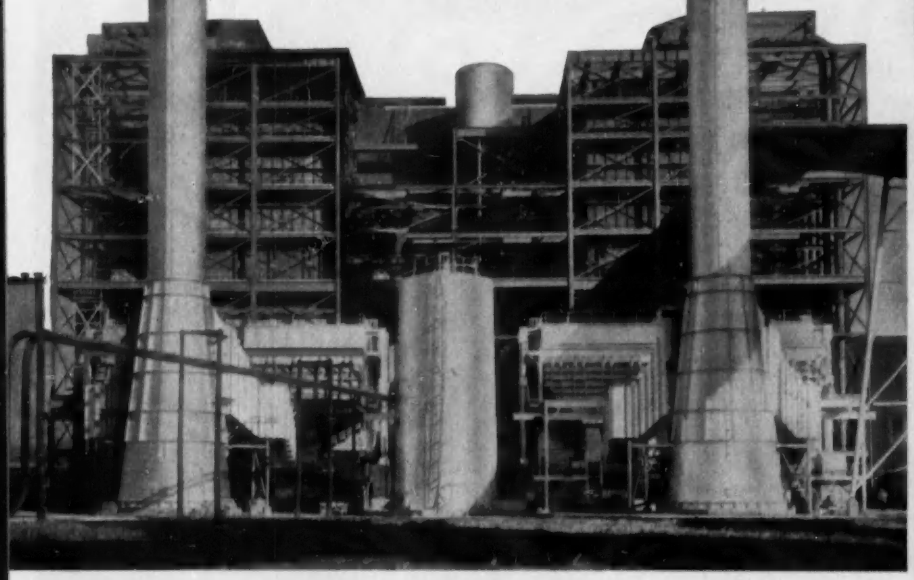
Northern California Chapter of NECA Board of Directors elected E. L. Buttner as its governor for the new year. Victor C. Perero, who was governor last year, will become president and Harold Pierce of Vallejo, vice-president, William A. Cyr, treasurer. Alameda County Branch chairman is Walter D. Vance Jr., vice-chairman, George Curran; Contra Costa County Branch chairman is Andy Maser, Chet Brunelle, vice-chairman. Solano-Napa Counties Branch chairman is Harold Pierce, vice-chairman is Art Tockey. Buttner has previously served as governor and has been the 6th District vice-president. He also serves as chairman of NECA's Research and Education Committee. Action was taken by the board to submit amendments to the chapter by-laws to increase its dues to a minimum of $2 per week in order to accommodate the change in the National dues minimum. Another amendment would make eligible for election as president or gov-

What are they using at Meramec?

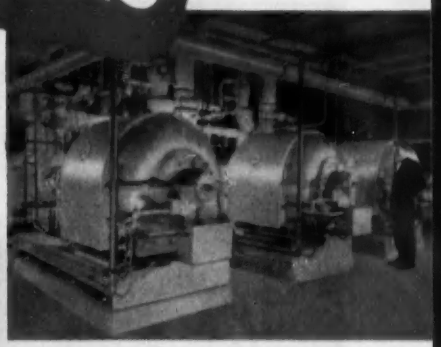
Another utility uses Allis-Chalmers motors. At Union Electric Company's new Meramec plant, all motors for all auxiliaries were furnished by Allis-Chalmers.

Allis-Chalmers builds a complete line of integral horsepower motors for power plant service. Your A-C representative will be glad to help you select the best motors to meet your needs.

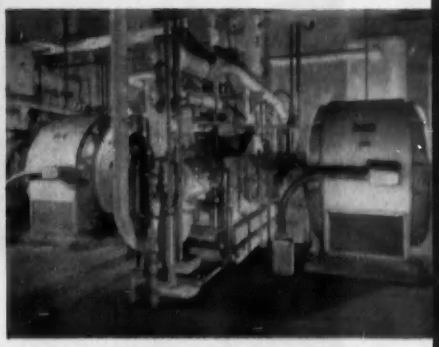
ALLIS-CHALMERS Auxiliary-Drive MOTORS



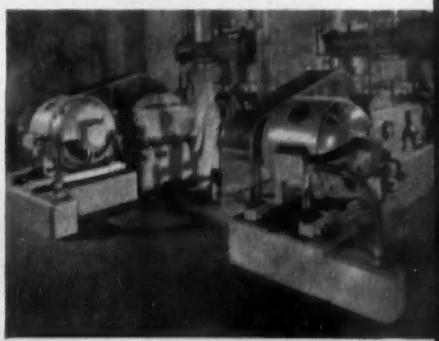
Built in the modern semi-outdoor style, Union Electric Company's Meramec station has two units with a total installed capacity of 250,000 kw.



Three of six 1500-hp, 3580-rpm, 4000-volt Allis-Chalmers two-pole motors driving boiler feed pumps.



Two of three 300-hp, 353-rpm, 4000-volt Allis-Chalmers squirrel-cage motors driving soot blower air compressors.



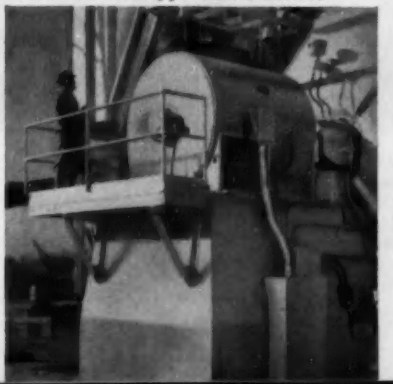
These compressors provide air for service lines . . . are driven by Allis-Chalmers 100-hp, 1170-rpm, 440-volt cage motors.

ALLIS-CHALMERS

Milwaukee 1, Wisconsin

A-C ALLIS-CHALMERS

Each induced draft fan is powered by an Allis-Chalmers 1000-hp, 710-rpm, 4000-volt tube-type TEFC motor.

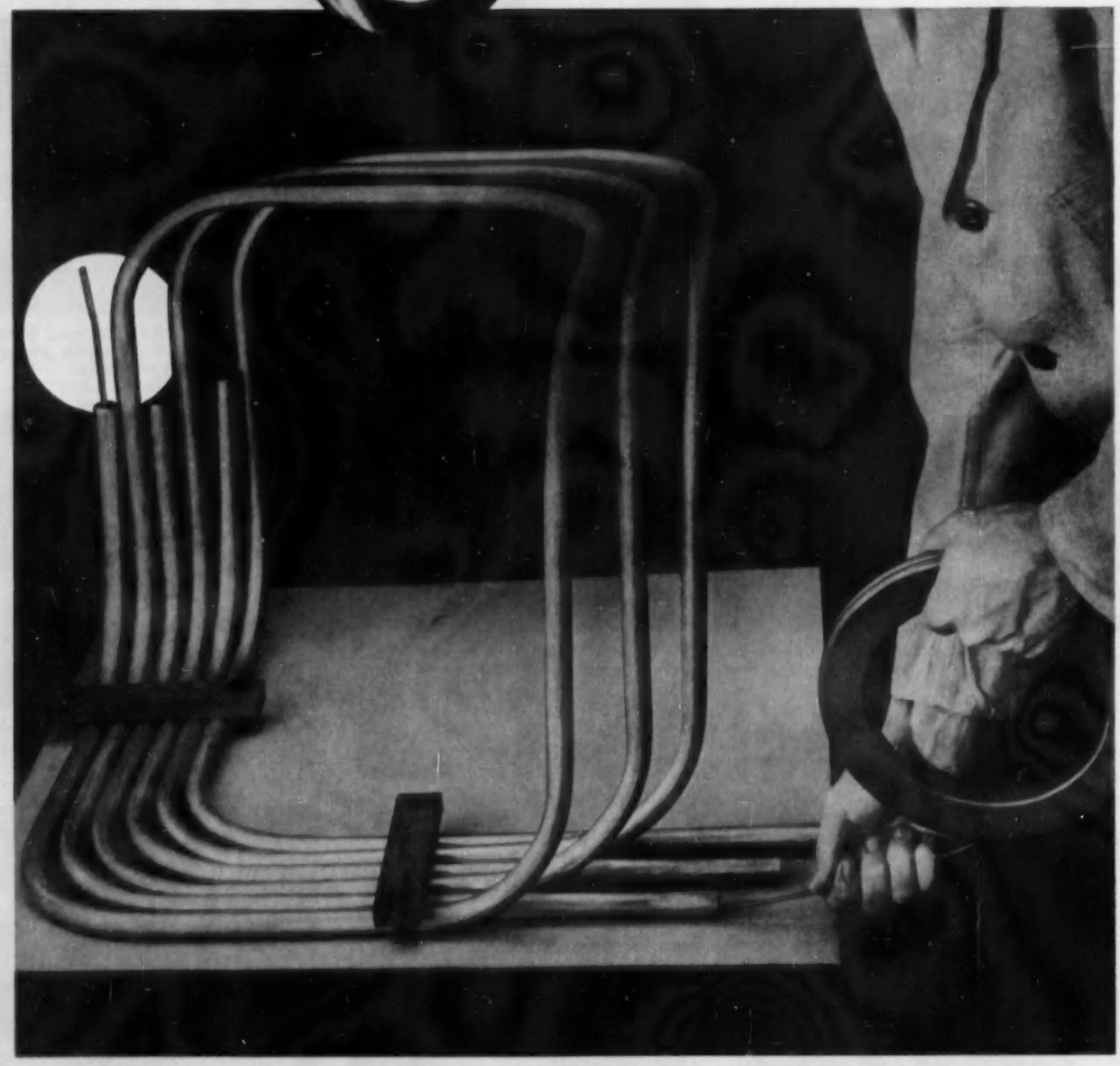


Four of these 500-hp, 425-rpm, 4000-volt vertical pipe-ventilated motors drive condenser circulating pumps.

A-4526

This slick, shiny new interior in Rome•EMT lets fish tapes slide through with an absolute minimum of resistance.

New inside finish



Here are three test runs of conduit, Rome•EMT (closest to you) and two leading competitors. Each ten-foot length of ½" EMT has been formed into eight 90° bends.

As you can see, the ⅛" fish tape was easily pushed through all eight bends in the Rome•EMT, in a matter of seconds. No amount of forcing would get the fish tape through either of the competitive brands. See the X-ray pictures at right above for details.

makes Rome · EMT easiest to fish

X-ray pictures prove Rome · EMT superiority

At left are three identically formed runs of ½" EMT (Electrical Metallic Tubing). Each ten-foot length has eight 90° bends (a maximum of four is allowed by the National Electrical Code) as an exaggerated test.

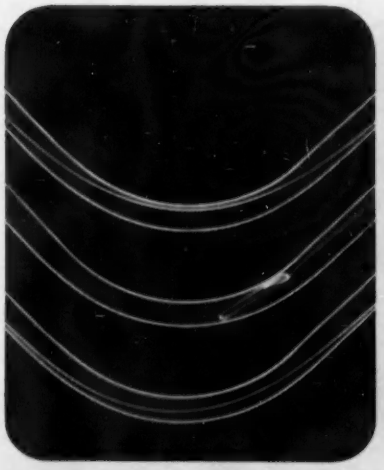
One of these runs is Rome Cable's new, easy-fishing EMT. The others are two leading competitors.

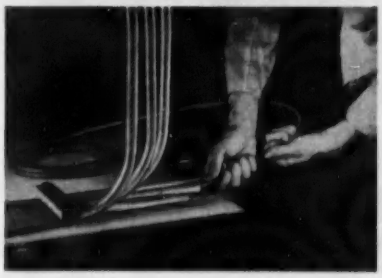
The superiority of Rome·EMT's new inside finish is demonstrated by running a standard ⅛" fish tape *as far as possible* into each of the three EMT test samples.

The pictures show the results of such a comparative test. The fish tape could be forced through only 4 bends in competitor A's EMT. In competitor B's EMT the fish tape stuck fast after rounding the sixth bend. *But the tape went easily through all eight 90° bends* and out the far end, in Rome·EMT.

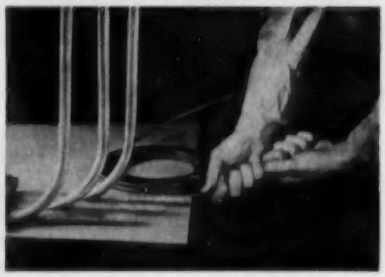
Rome·EMT's new inside finish is the reason for this outstanding performance. Prove it for yourself—*pick any competitive EMT, bend it identically with a length of Rome·EMT; and then try the fish tape test.*

You'll find, just as we did, that Rome·EMT will win in this test of direct comparison. To see for yourself how good Rome·EMT really is, contact your nearest Rome Cable Sales Office for a free test length—try the fish tape test—learn how Rome's new inside finish can save *you* time and money on installations.





The lower photo shows a ⅛" fish tape being forced into competitor A's EMT. The X-ray picture above shows you how the fish tape hung up on the fourth bend, indicating inferior inside finish.



Here, the lower picture shows a ⅛" fish tape being run into competitor B's EMT. As you can see from the X-ray photo, it was stopped at the seventh bend, again indicating inside surface resistance.

Rome • EMT is stocked at these convenient warehouse points:

Atlanta, Ga.	Denver, Colo.	Rome, N. Y.	Seattle, Wash.
Chicago, Ill.	Kansas City, Mo.	Salt Lake City, Utah	St. Paul, Minn.
Dallas, Texas	Los Angeles, Calif.	San Francisco, Calif.	Torrance, Calif.

It Costs Less to Buy the Best

The X-ray photographs were taken by the Anstice Co., Inc., Rochester, N. Y., and witnessed by Chester Uffelman, Notary Public.

ROME CABLE Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

ernor of the chapter a past member of the board of directors. This would enlarge the list of qualified persons available for the offices of president and governor. The chapter's Job Management Course will definitely begin about March 1. It has been postponed on two different occasions because of delay in publication of some of the study units.

Los Angeles Chapter, NECA, re-elected Charles A. Wikle as its president at the annual election in December. Andrew L. Hannon was named vice-president, J. B. Shammel treasurer and the governor is Syd Hill. The board of directors consists of Cliff Allen of Pasadena, Richard Arbogast, Lou Barth, Al Berg, Oscar Schagnon, Harry Keith, Robert J. MacFarland of the Orange County division, Al Short the Harbor Division and Harry Vancott. The chapter will participate in a new television program called "Research House for 1955" as one of the sponsoring organizations in the Los Angeles Home Show. The program will run for six months beginning in February, once a week for a half-hour show.

TAMA

Tucson Appliance Merchandisers Assn. has just off the press a new brochure in which it shows how "It Pays To Be A Member of TAMA." It declares the purposes of the organization clearly, tells what its operations are, lists the services performed and the advertising it does, and ends with a list of officers and of members. New officers recently elected are Clayton Niles, Niles Radio & Television Center, president; Jack Mitchell, Mitchell Furniture Co., vice-president; Verne Easton, Arizona Wholesale Supply Co., secretary; Tom Fleming, Bank of Douglas, treasurer. Manager is R. G. Cox and membership now numbers 60 firms. A TAMA Appliance Festival is to be staged Jan. 27-30 as its first appliance show and the first in the city. Lee Hancock of the Tucson Gas, Electric Light & Power Co., will have charge of the appliance demonstration shows.

Dealer Associations

Salinas Valley Gas & Electric Appliance Dealers Assn. elected Arthur Kersch as its new president. Joe Kotick, first vice-president, Walter Brooks, second vice-president and Ellis Langley Jr., PG and E, secretary-treasurer.

Santa Cruz - Watsonville Gas & Electric Appliance Assn. named Ted Colton, California Furniture Co., Watsonville, as its president, and LeRoy Julien, Costella and Caiocca, Santa Cruz, vice-president. Milo A. Cain, PG and E, Santa Cruz, serves as secretary.

Engineers

Whether membership in a union type of association or the traditional professional society is the best means of bargaining for salary increases and other benefits was debated by two speakers before the first state-wide convention of the Professional Engineers of Oregon since 1930. Fred O. McMillan, head of the electrical engineering department of Oregon State College and a former AIEE president, and Dora Hendricks, business manager of the Seattle Professional Engineering Employees Assn., were speakers.

CMUA

Judging from the tentative program for the annual meeting of the California Municipal Utilities Assn. to be held in Sacramento Feb. 22-25, those who attend will have a busy and profitable session. Subjects include atomic power production, California water law, supervisory training, suggestion plans, Trinity River development and human relations. Governor Knight will be one of the speakers.

1955 Association Meetings Scheduled

January

27-28—**Pacific Coast Electrical Assn.** Business Development Section, Hotel Californian, Fresno.

February

. . . **Intermountain Electrical Assn.** annual conference, Hotel Ben Lomond, Ogden.
22-25—**California Municipal Utilities Assn.**, Sacramento.
23-24—**PCEA Administrative Services**, special seminar, Hotel Statler, Los Angeles.

March

7-8—**PCEA Engineering and Operating Section**, Sheraton-Huntington Hotel, Pasadena.

April

5-7—**Electrical Maintenance Engineers Assn.** of So. Calif., conference, University of Southern California, Los Angeles.
7-8—**PCEA Administrative Services Section**, Jokake Inn, Phoenix.
11-13—**Illuminating Engineering Society**, Rocky Mountain Regional Conference, Phoenix.
14-15—**IES Pacific Southwest** Regional Conference, Hotel Statler, Los Angeles.
25-26—**IES Pacific Northwest** Regional Conference, Harrison Hot Springs, B. C.
13-15—**Northwest Electric Light & Power Assn. Engineering and Operating Section**, Hotel Davenport, Spokane.
17-19—**Rocky Mountain Electrical League**, Spring Conference, Denver.
20-22—**Northwest Public Power Assn.**, Eugene.

May

9-11—**Northwest Electric Light & Power Assn. Business Development Section**, Salt Lake City.
11-13—**Pacific Coast Electrical Assn.** annual convention, Sheraton-Palace Hotel, San Francisco.
19-20—**Northwest Public Power Assn.** Engineering and Operating Section, Longview, Wash.
26-28—**National Electrical Contractors Assn.** annual District 6 and 8 conference, San Francisco.

June

6-10—**National Industrial Service Assn.** national convention, Hotel Statler, Los Angeles.
13-16—**Edison Electric Institute** national convention, Hotel Statler, Los Angeles.
22-24—**NWEL&PA, Accounting & Business Practice Section**, Hotel Vancouver, Vancouver, B. C.
27-29—**Canadian Electrical Assn.** national convention, Vancouver, B. C.

August

15-16—**American Institute of Electrical Engineers**, Hotel Finlen, Butte.

September

11-14—**Rocky Mountain Electrical League** annual convention, Grand Teton Hotel, Jackson Hole, Wyo.
12-14—**International Association of Electrical Inspectors, Northwestern Section**, Ogden or Yakima.
19-21—**International Association of Electrical Inspectors Southwestern Section** annual meeting, Arrowhead Springs Hotel, San Bernardino or Mission Inn, Riverside.
26-28—**National Association of Electrical Distributors**, Empress Hotel, Victoria.

October

1-8—**Northern California Electrical Bureau**, Electrical Exposition, Oakland Civic Auditorium.

November

9-10—**PCEA-Hawaiian Section**, Honolulu.

PERHAPS WE'LL HAVE TO ADD A PINCH, FOR YOU...

Just ask us for an alloy we haven't got — we'll be delighted.

Because that's how each of the more than 80 resistance and electronic alloys Driver-Harris makes had its beginning. Each of these highly specialized alloys is custom-made . . . produced exactly to the specifications of our customers.

The physical and chemical properties of an electrical resistance alloy can be altered greatly by a minute difference in its constituents. Often just a few ounces to the ton can make the difference you need.

One thing you can always rely on in any Driver-Harris alloy: it is made to the most precise metallurgical checks and controls known to the industry. It is these exclusive quality controls that have made Nichrome V and Nichrome* the standard for over 50 years by which all other electrical resistance alloys are measured.

Perhaps in a sense Nichrome is *too* well known. For we don't want people to forget that we make many other resistance alloys of sustained high quality to meet other special needs. And that, as we said at the outset, our engineers will be more than delighted to start afresh tomorrow to devise a new one, custom-made for you. Just tell us as exactly as you can what you wish to accomplish.

NICHROME V and NICHROME are manufactured only by

Driver-Harris Company

Western Representative: **ANGUS-CAMPBELL, INC.**

5320 Santa Fe Ave., Los Angeles 58 917 Bryant St., San Francisco 3

Main Office and Plant: HARRISON, NEW JERSEY

*T. M. Reg. U. S. Pat. Off.

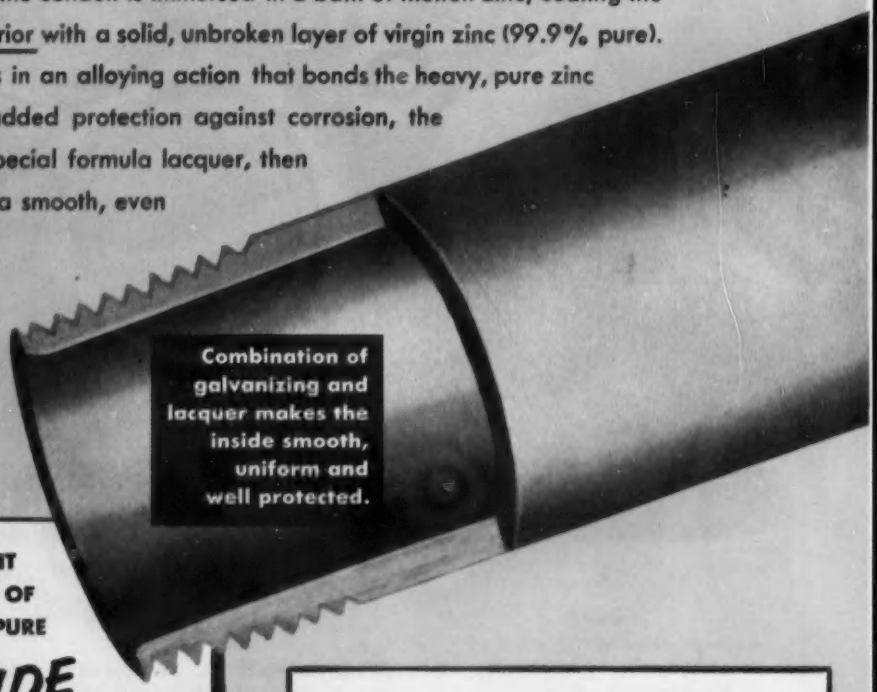
MAKERS OF THE MOST COMPLETE LINE OF ELECTRIC HEATING, RESISTANCE, AND ELECTRONIC ALLOYS IN THE WORLD

Here are the facts about Triangle's *Hot-*

Triangle Hot-Dip Galvanized Rigid Steel Conduit is produced from choice sections of the highest grade ingots. This insures a perfect base for proper bonding of the zinc. Every length is thoroughly scoured and pickled in acid, leaving the pipe perfectly clean before the application of the protective zinc coating.

When perfectly clean, the conduit is immersed in a bath of molten zinc, coating the *interior* as well as the exterior with a solid, unbroken layer of virgin zinc (99.9% pure). The hot-dip process results in an alloying action that bonds the heavy, pure zinc coating to the pipe. As added protection against corrosion, the conduit is submerged in special formula lacquer, then baked, giving the conduit a smooth, even finish.

Conforms to Federal Spec. WWC-581b (Galvanized)



Combination of galvanizing and lacquer makes the inside smooth, uniform and well protected.

EVERY LENGTH OF CONDUIT IS IMMERSED IN A BATH OF MOLTEN ZINC — 99.9% PURE

INSIDE AND OUTSIDE

Every square inch of the conduit — inside and outside — is thoroughly and uniformly coated with pure zinc. Remember, because of condensation, the inside of conduit is just as subject to corrosion as the outside. That's why it's important to specify Triangle Conduit — protected inside and outside.

HOT-DIP GALVANIZING IS UNIFORM *NOT TOO THIN-*

Coatings that are too thin in even one spot, are likely to develop tiny pin-point holes through which corrosion can creep. There is no possibility of thin spots in zinc applied by the Triangle hot-dip galvanizing method. The thickness of the zinc coating is uniform — *exactly* the same from one end to the other. Hot-dip galvanized coating is two or three times as thick as other coatings.

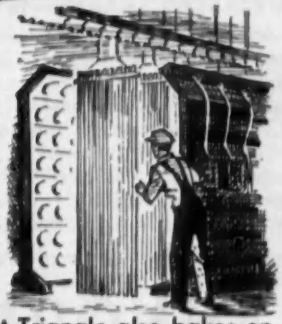
Dip Galvanized Conduit.

NOT TOO THICK-

If the coating on conduit is too thick, it is subject to cracking and flaking when being bent. Careful controls keep the coating of Triangle Conduit at just the *right* thickness — always.

Never too thick — never too thin.

AND *AN EXTRA BONUS!*



A clear lacquer is applied and baked on the conduit. Not only does Triangle apply the best protective coating (molten zinc) but Triangle also bakes on an additional transparent lacquer of special formula. The application of this baked-on coating insures a permanently smooth interior (for easy pulling) and also provides additional protection against rust or corrosion. It also protects the conduit during shipment.

TRIANGLE CONDUIT is Hot-Dip Galvanized—

and TRIANGLE'S Hot-Dip Galvanizing has never been surpassed!

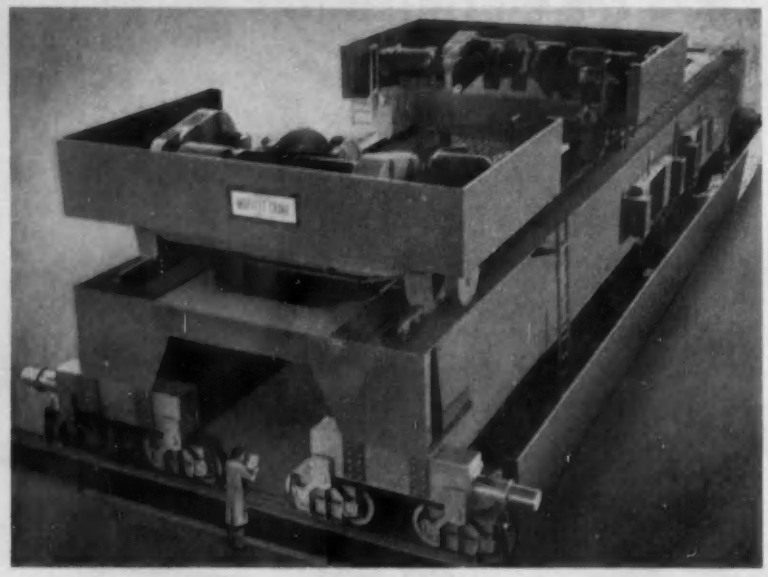
TRIANGLE CONDUIT & CABLE CO., INC. New Brunswick, N. J.

Manufacturers of Arteries for Electricity, Liquids and Gases

WIRE • CABLE • CONDUIT • PLASTIC PIPE • BRASS AND COPPER TUBE

Plants—New Brunswick, N. J.: Wire and Cable Plant, Rod Mill, Brass and Copper Tube Mill, Plastic Pipe Plant. Moundsville, W. Va.: Conduit Plant.

"It MUST Be Right!"



OVERHEAD CRANES — ¼ to 650 Tons

Shop fitting a MOFFETT overhead crane built for the power house at Garrison Dam. Two of these huge machines will work together to handle loads up to 600 tons. Complete and careful shop assembly and coordination of deliveries to your erection schedules insure easy, confusion-saving installation on the job. For a "plant individualized" crane, consult MOFFETT NOW!

MOFFETT ENGINEERING COMPANY

Traveling Cranes · Hoists

579 Cleveland Ave., Albany, Calif. • LA. 5-4916
3920 N. Mission Rd., Los Angeles 31 • CA. 2-7161
15 Park Row, New York 38 • WO. 2-7048

ANNOUNCING . . . a new San Francisco Address . . . expanded facilities to serve you better . . .

870 Tennessee Street
San Francisco 7
Phone: ATwater 8-6900

Other district sales offices and warehouses:

LOS ANGELES PHOENIX
SEATTLE PORTLAND

Engineers and Factory Distributors

MAYDWELL & HARTZELL
INCORPORATED

PCEA Panorama

Section plans seminar on electronic data processing

Of particular interest to all segments of the electric industry and especially management people is the seminar on electronic data processing to be sponsored jointly by the Pacific Coast Electrical Assn. and the Pacific Coast Gas Assn. Feb. 23 and 24 at the Statler Hotel in Los Angeles. E. R. Peterson, Southern California Edison Co., and Dexter Stoner, Pacific Gas and Electric Co., are co-sponsors of the meeting.

Joseph S. Glickauf and John A. Higgins, management consultants of Arthur Andersen & Co., who will be on the program, have said in their article entitled *Electronics Down to Earth:*

"Reports for management have revolved around the summarization of transactions that have already transpired—in other words, historical reporting. In a very real sense, management has been driving down the business highway using only the rear-vision mirror. Had the tools been available with which to prepare timely projections and forecasts as a guide for future operations, the business executive would have been in the position of looking through the windshield and using the rear-view mirror of historical reporting only as a means of correcting any distortions in his forward look."

But as John L. Liecty, Arizona Public Service Co., chairman of the Accounting Section of the Pacific Coast Gas Assn., pointed out recently, "Machines are available today—now—that can correct the situation. They are fantastically fast. However, it is not alone that one bank has reduced one calculation from 1,000 man-hours to 9½ minutes, not that a steel company has reduced the time of making monthly interdepartmental distribution of charges from 300 hours to 35 minutes that should engage our attention. It is the implication to professional management of greater control of operations through the use of proper and timely reporting."

The seminar on electronic data processing will bring up-to-the-minute information on these new machines and new methods. The program has been designed to acquaint managements of member companies with the broad scope potential use of high-speed electronics data processing devices as they may apply to utility problems so that managements, in their planning, can provide for appropriate study and research in the more

technical aspects of specific machine applications.

A distinguished group of consultants and speakers, as well as representatives of two leaders in the manufacture of electronic business machines, will participate in this outstanding program. All meetings except the final one are at the Statler Hotel. Highlights are as follows:

Monday session, Feb. 23 — Everett S. Calhoun, manager, electronic data processing research, Stanford Research Institute, will introduce the general subject matter of the seminar and bring to the group a discussion of the latest developments in the field of electronic machine application to business. Calhoun is eminently qualified in this field and will have returned from a four-month stay in Europe where he has been studying international developments in the field of electronics.

Luncheon speaker, Feb. 23 — Dr. Howard Aiken, director of Harvard University's electronic computer laboratory. He is engaged in a research project sponsored by the Edison Electric Institute and the American Gas Assn. on the application of electronic machines to utility problems.

Afternoon session, Feb. 23 — Remington-Rand Inc. will make a presentation of Univac application. Erwin Tomash will head up and coordinate this meeting, together with Mr. Voorsanger and others of the Remington-Rand organization.

Morning session, Feb. 24—International Business Machines will present material on electronic computer applications and integrated data processing, under the direction of George F. Trexler, manager of IBM's public utility department.

Afternoon session, Feb. 24, Southern California Edison Co. auditorium—Joseph S. Glickauf and John A. Higgins will conduct this session. They participated in the General Electric Co. installation of the first large-scale computer to be used for business and commercial application, and are now engaged in Arthur Andersen & Co.'s studies in the same field for certain public utilities.

IAEI

Oregon Chapter has elected Joseph Gray, chief electrical inspector for the city of Portland, president. Other officers are: Larry Sisson, state inspector, vice-president; James S. Backenstos, a city inspector, secretary-treasurer. Also serving on the executive board are Ralph Farnum, Portland contractor; Franklin Kincade, Portland General Electric; Harry Baker, a state inspector.

FLUSH INSTALLATION
above all else
CUT OVERHEAD GLARE
"NEVA-GLARE" for Stores
"NEVA-GLARE" for Institutions
"NEVA-GLARE" for Commercial Buildings
"NEVA-GLARE" for Factories & Laboratories
specify...
marlou
"NEVA-GLARE"
LIGHTING FIXTURES
with Plexiglas Diffuser
Easy to install • Easy to clean and maintain
Solve your lighting problems with "NEVA-GLARE" fixtures—diffused, glare-free yet bright lighting, that makes for relaxed efficiency. You will know the moment you turn them on.
MARLOU'S new line of "Neva-Glare" Plexiglas units are opthalmically designed to diffuse light evenly with an absolute minimum of light absorption. "Neva-Glare" fixtures are made to blend into the surroundings and the Plexiglas is easily removed for cleaning and maintenance, no tools required.
Available in square or rectangle units that are adaptable for flush or recessed installation. E.T.L. Curves on request
"Above all else... MARLOU is Quality Lighting".
Some select territories open to recognized Manufacturers Agents
RECESSED INSTALLATION
ARCHITECTS - BUILDERS
Specify "NEVA-GLARE" the modern way to modern Lighting.
marlou
LIGHTS, INC.
FANWOOD, NEW JERSEY
A complete line of lighting fixtures for Fluorescent, Slimline and Cold Cathode Lights.
Write For Complete MARLOU Catalog #1006

THE MONTH IN BRIEF

Legal Staff Supports Idaho Power

FPC's legal staff has recommended adoption of Idaho Power Co.'s three-dam plan for development of Hells Canyon. In their brief to Examiner Costello, the lawyers were strongly in favor of the Idaho plan; said that, while it had no economic superiority over the single high dam, it provides almost all the benefits that would flow from a federal project and the utility is completely capable of carrying out the project. Filing of second briefs and other formalities probably will mean that it will be another six months before an FPC ruling may be expected.

McKay on Partnership Program

The administration's partnership program is the only alternative to stagnation or socialism, Interior Secretary Douglas McKay declared in Salem, Ore., last month. He said that the program is based on laws that were on the books in the Truman and Roosevelt administrations. "We do not plan to reduce our people to dependency on Washington because a few vocal left wingers and self-proclaimed intellectuals deny the lessons of history," he stated. The federal government will continue to meet its responsibilities in the construction of large multipurpose projects that are beyond the means of local public or private enterprise, he promised.

Northwest Interests Seek FPC Permits

Pacific Northwest interests have filed applications with FPC for power projects totaling almost $2 billion and 6,000,000 kw, Interior Secretary McKay said in a speech before the Western Forestry and Conservation Assn.'s San Francisco conference last month. He said most of the applications have been filed since announcement of the administration's partnership program.

Columbia River Proposal Being Revised

Revision of the Columbia River Development Corp. proposal of Northwest Public Power Assn. will delay its presentation to Congress, it was reported last month. The bill is to be reworded limiting its scope to geographic limits of the four principal states of the region and providing for eventual election or home state appointment of four directors.

Order to Conserve Water

Commercial and industrial water users in Denver were ordered to install recirculation devices to conserve water. The order was made by the Denver Water Board in an effort to meet the problem created by continuing drouth and unprecedented residential expansion. The order is expected to save at least 12,000 acre-ft of water annually. Required to install the recirculation equipment are buildings, businesses and industries with cooling or air-conditioning systems having a capacity of two tons or more of refrigeration and those using more than 20,000 gal of water per month in cooling, heating or industrial processing.

Fuel-Fired Plants Increasing

Fuel-fired plants will produce more than half the electric energy for the Pacific Northwest within the next quarter of a century, Idaho Governor Len Jordan forecast in Spokane last month. Jordan, who becomes chairman of the U. S. section of the International Joint Commission this month, said that engineers realize that costs of hydro plants are going up and costs of thermal production are growing cheaper. "This means we should develop the best dams first, because sooner or later we will encounter the competition of the thermal development of electricity, he advised. He set 1985 as the date when "more than half the electric energy generated in the Northwest will be by fuel-fired plants; predicted that all feasible hydro projects will have been exploited by 1975.

Bill Would Ban Closed Shop

"Right-to-work" legislation banning closed or union shop agreements will be offered to the Colorado Legislature during the current session. It is sponsored by the State Chamber of Commerce; is similar to a measure defeated two years ago.

Fund or Water Projects Advocated

In California State Engineer A. D. Edmonston has come forward with a recommendation that the legislature provide $50,000,000 annually for water projects. He advocated a sum similar to the state highway construction fund, financed from highway users taxes; said he had no specific type of water tax in mind.

Wyoming Site Explored

Wyoming National Resources Board reports that Reynolds Metals Co. is continuing its investigations of the Lake DeSmet area near Buffalo, Wyo., for location of a power plant and aluminum reduction plant.

Test Run Made at Lookout Point

First of three 38,000-kw units at Lookout Point Dam power house in Oregon were put on the line on Dec. 16. The generator was to be on a test basis for 30 days. The new power supply is expected to increase continuity of service to Eugene and southwest Oregon load centers.

Agreements Signed for Natural Gas

Agreements signed last month by major pipeline companies will make natural gas from the Peace River area of British Columbia and Alberta available to United States markets as supplemental supply. Signed by Pacific Northwest Pipeline Co., Westcoast Transmission Co. Ltd. and El Paso Natural Gas Co., the agreements call for Pacific Northwest Pipeline to take 300,000,000 cu ft per day from Westcoast at the Canadian boundary; deliver 250,000,000 cu ft to El Paso Natural at a point near Mountain Home, Idaho.

Right off your Square D Distributor's shelf!

New QMB Saflex Distribution Panelboard

Exactly the Power Panelboard you want—when you want it. Your Square D Distributor stocks boxes, interiors and plug-in units which can be quickly assembled to meet virtually any specifications. Above, interior ready for easy mounting in box.

Plug-in Units are installed easily on tubular bus bars. The solid neutral can be changed in minutes. Here is flexibility that reduces "down time" and saves money.

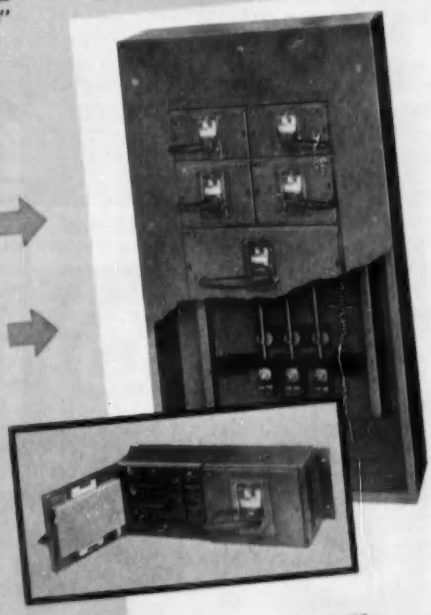
Three Simple Assembly Steps Fronts, with adjustable trim clamps, are available with or without doors.

With ALL these Quality Features

INTERIORS are flexible and adaptable to almost any service and voltage. Plug-in units and solid neutral can be changed simply and quickly.

BOXES provide generous wiring space.
FRONTS furnished with or without doors have adjustable trim clamps.

UNITS have quick-make, quick-break switch mechanism, visible blades and are horsepower rated. 30, 60, 100 and 200 ampere units are plug-in, while 400 and 600 ampere units are bolted to the bus.



•Underwriters' Approved for Service Entrance

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

THIS MONTH'S NEWS

State PUC Regulation Suggested for Co-ops

Public Service Co. of Colorado has suggested that, if rural electrics plan to serve entire new communities of housing developments, they should be regulated as public utilities by the State Public Utilities Commission.

The company made its proposal after the Union Rural Electric Assn. of Brighton, Colo., filed a court action in an effort to block it from serving Western Hills, a 6,000-home development on Denver's northern outskirts.

A statement by Robert T. Person, director of public relations for the company, said:

"Public Service Co. is planning on serving Western Hills subdivision the same as other developments in the Denver area. It is presently supplying service to areas north, south, east and west of the city, which the company has contended it was obligated to serve as a public utility.

"The REA supplies electric service to its members only and contends it is not a public utility. If it holds itself open to serve communities of this type before it is known who the customers ultimately will be, it therefore must become a public utility and consequently subject to the jurisdiction of the Public Utilities Commission."

John Kalcevic, the REA's manager, charges the power company has violated a mutual trade territory agreement by "invading" REA territory by extending lines to service Western Hills, expected to produce about $360,000 a year electric business. Kalcevic claims the developers of Western Hills, headed by Barr Lumber Co., asked the REA to provide electric service.

Private Company Makes Bid for City System

California Electric Power Co. has offered to purchase Riverside's Municipal Department of Light for approximately $6,000,000.

The proposal was referred by the Riverside city council to the city's board of public utilities for study and recommendation. For the sale to go through, the council would have to vote 5-2 to submit it to the city's voters. An election on the issue would probably take place next spring.

If the sale is consummated, CalElectric will build its proposed new $1,840,000 office building in Riverside, rather than in the city of San Bernardino, Calif., as originally planned. The company's eight-county service area includes the area surrounding Riverside but not the city itself, and the utility's board of directors decided the company should be headquartered in a municipality it serves.

Group Asks Definition of Utility New Construction

Contending that some $500,000,000 worth of new construction work is done for Western utility companies by maintenance men when the work belongs to construction men, the AFL Far Western Conference of Building Trades Councils has resolved to ask AFL headquarters in Washington to define new construction as related to utilities. This decision was reached at the Far Western Conference's second annual convention in San Francisco.

A spokesman for the conference said utility companies have been hiring maintenance men to do new construction work at a lower rate than construction men would demand. "Worse yet," said the spokesman, "they have hired nonunion laborers to fill out the work force."

Work involved in the jurisdictional dispute includes construction of new pipelines, substations, buildings, roads and high-tension lines.

Permitting maintenance men to do such work for repair purposes was opening wedge, the spokesman said, leading to increasing use of maintenance men on new projects.

One solution to the problem, building trades feel, would be memoranda of understanding with utilities guaranteeing that new work would be let to private contractors.

Maintenance workers involved in dispute are affiliated with various unions, including International Brotherhood of Electrical Workers.

• **The 27th annual rural electric conference,** conducted by California Committee on the Relation of Electricity to Agriculture, will be held at the University of California, College of Agriculture, Davis, Feb. 7 and 8.

WWP Asks Permit for Montana Hydro Plant

Washington Water Power Co. has filed application with the Federal Power Commission for permission to build an $87,000,000 hydroelectric plant at Noxon Rapids, Mont. The project would have an output of 385,000 kw and the proposed construction program calls for first production in the fall of 1959.

The plan includes a 190-ft-high concrete and earth-filled dam extending nearly a mile across the Clark Fork River in Sanders County, 23 miles upstream from the company's recently completed Cabinet Gorge power plant.

According to J. E. E. Royer, vice-president and general manager, estimated cost includes major transmission facilities to connect with load centers in service areas in Idaho and Washington.

Noxon Rapids would be WWP's twelfth and largest power plant and would nearly double the company's present 450,000 kw capacity. When fully developed it should make the company self-sufficient in regard to power needs, Royer said.

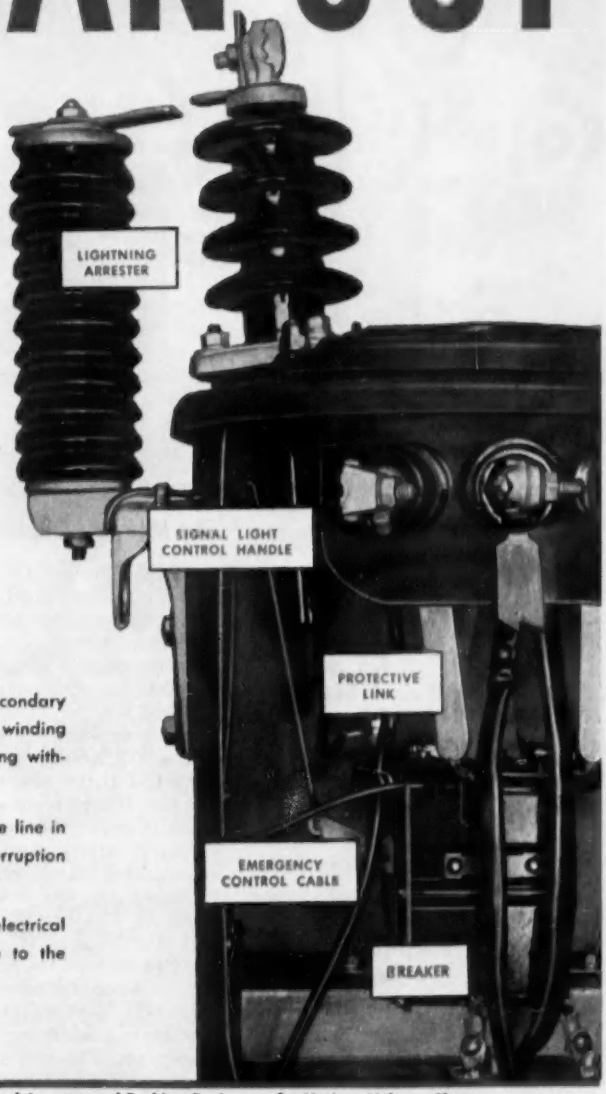
If a license is granted and the company can start construction by next July, the first unit of the plant can be on the line during the fall of 1959, he stated, and it is believed that the Northwest Power Pool will have adequate resources to carry the area through until that time.

The company plans a 5,220-ft-long dam across the Clark Fork. Spillway and power house intake section would be of concrete and would extend 1,120 ft. Earth-filled wings would extend some 3,200 ft on the southwest bank of the river and some 900 ft on the northeast bank.

The power house, to be located on the southwest bank, would have a head of 154 ft and would contain vertical semioutdoor type generators with a rated capacity of 328,000 kw, but capable of an output exceeding 385,000 kw. The dam would back water 37 miles to Thompson Falls with the reservoir area covering 8,650 acres.

The Noxon Rapids project would be more than 50% larger than the present WWP Cabinet Gorge project, which was completed last year at a cost of more than $48,000,000.

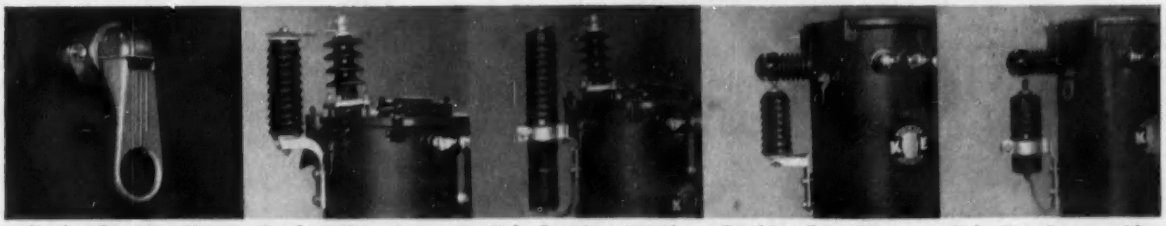
KUHLMAN CSP



Four-way protection gives better service, longer life at lower cost

1. **Protects customer service** by signaling a warning in growing load areas before overloading occurs and providing for emergency overloads.
2. **Protects transformer life** by providing a secondary breaker that operates within the safe limits of the winding temperature and protects against unsafe overloading without sacrificing short-time overload capacity.
3. **Protects the line** by clearing transformer from the line in case of internal failure and preventing service interruption to the remaining transformers on the line.
4. **Protects against lightning** by safely bypassing electrical surges without interruption of service or damage to the transformer.

Optional Arrester and Bushing Equipment for Various Voltage Classes



Breaker Operating Handle with Warning Light and Emergency Control Lever.

Expulsion Type Arrester with Isolating Gap.

Valve Type Arrester with Isolating Gap.

Expulsion Type Arrester with Isolating Gap.

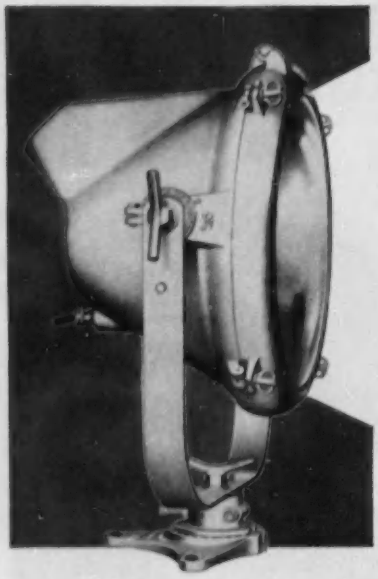
Valve Type Arrester with Isolating Gap.

Voltages above 5,000 Volts Mountings Are Interchangeable. Voltages Below 5,000 Volts Mountings Are Interchangeable

165

DISTRIBUTED BY **MAYDWELL & HARTZELL, Inc.** • SEATTLE, SPOKANE, PORTLAND, SAN FRANCISCO, LOS ANGELES, PHOENIX

KUHLMAN ELECTRIC COMPANY • BAY CITY, MICHIGAN • CRYSTAL SPRINGS, MISSISSIPPI • SALINAS, CALIFORNIA



FOR LONG-RANGE ECONOMY...
SPECIFY...

PYLE-NATIONAL
ENCLOSED FLOODLIGHTS

WEATHER-TIGHT... DIRT-TIGHT

For permanent, outdoor lighting installations, Pyle-National floodlights are the most economical in the long run.

Rugged, corrosion-proof materials and tight gasket sealing against dirt and moisture keep maintenance and replacement costs exceptionally low. Pyle-National floodlights will retain their original high efficiency output indefinitely. Many installations are still in excellent operating condition after 25 years of service!

Write for catalog 2100, which gives a complete description of our extensive line of heavy duty floodlights. Sizes: 10"-12"-14"-16"-20"-23".

Sold nationally through authorized distributors.

SINCE 1897

THE PYLE-NATIONAL COMPANY
1364 North Kostner Avenue • Chicago 51, Illinois
District Offices and Representatives in Principal Cities of the U. S. and Canada

PLUGS AND RECEPTACLES • PYLET CONDUIT FITTINGS

WORK UNDERWAY ON EDISON PLANT NEAR LONG BEACH

Preliminary construction work is under way for Southern California Edison Co.'s $24,000,000 steam-electric generating station, Alamitos, east of Long Beach. Initially, the plant will contain one 156,000-kw generating unit with either oil or gas utilized as fuel. Eventual plans call for the installation of four such units, with the first one scheduled for service late in 1956.

The Alamitos steam station will provide power for east Long Beach, and the adjacent Los Angeles and Orange County areas.

More than 74,000 new electric meters were added to Edison lines last year with approximately 78,000 new meters expected for this year. The company has spent more than half a billion dollars for plant expansion since 1948.

Person Addition Completed By Mexico Company

Public Service Co. of New Mexico has completed a $4,700,000 addition to Person station—its main generating plant in Albuquerque, N. M.—boosting the plant's name plate capacity to 73,000 kw with overload capacity of 87,000 kw.

The newest addition, phase three in a $16,000,000 expansion program started three years ago, winds up major construction of generating facilities until 1956, according to Arthur Prager, utility president. Phase one, completed in November 1952, and phase three, which was put in operation in October 1953, each consisted of 20,000-kw units.

Prager recently returned from New York where he completed sale of $1,500,000 30-year 3⅜% first mortgage bonds to help finance the utiilty's 1955 program. The bonds were the second half of a $3,000,000 issue authorized early this year and first half was sold in March.

Bond Issue Approved by Salt River District

Salt River Power District shareholders have approved a revenue bond issue of $11,000,000 by a vote of more than nine to one. Money will be used to help finance a new 100,000-kw steam plant in the Phoenix area.

Construction of the new plant is expected to start in August 1955, with completion scheduled for the spring of 1957. According to Stanley A. Ward, general manager, the new plant can be compared in many ways to the 100,000-kw Kyrene steam power plant, which the district recently placed in operation near Tempe, Ariz. In some respects it will be more advanced.

A single 100,000-kw generating unit will be installed. Operating pressure will be 1,450 lb per square inch with a steam temperature of 1,000 F. Overall design will be of the out-door type.

Grant PUD Starts Core Drilling at Dam Site

Core drilling on the site of the Priest Rapids Dam on the Yakima County side of the Columbia River has been started by the Boyle Bros. Co. of Salt Lake City, under a $107,050 contract with the Grant County PUD.

The test drilling is one of the steps necessary before the PUD or any agency can apply for a license to build the dam, which is estimated to cost between $360,000,000 and $400,000,000. Work is being pushed 24 hours a day in order to finish the tests during the low-water season.

• **A $339,523 loan** for improvement of facilities of the Sun River Co-Operative's rural electrification system has been approved by the REA, A. A. Wells, Fairfield, cooperative manager, announced. The Fairfield system is one of the largest REA systems in Montana, operating more than 1,800 miles of distribution lines and five substations in eight counties. The system serves 2,350 members and consumers. The system purchases its power from Montana Power Co. at wholesale rates, same as Bureau of Reclamation charges for wholesale power.

• **A $1,438,612 project** which will double capacity of the Centralia, Wash., municipal power plant to 10,000 kw is scheduled for completion April 15. Contracts have been awarded for transformers, generators, turbine, penstock and general construction, with only a $310,000 contract for a new concrete fishway yet to be made. Municipal crews have rebuilt the 27-mile transmission line from the plant at Yelm to meet the extra power load.

• **City of Seward,** Alaska, has received a preliminary permit from the FPC for a proposed hydroelectric project on Ptarmigan Creek on the Kenai peninsula, about 25 miles from the city. The project calls for a low dam at the lower end of Ptarmigan Lake, with 14,000 ft of pipeline and a penstock leading to a power house on Kenai Lake, with an initial 1,100 kw.

BIDS CALLED ON SIX UNITS FOR CHIEF JOESPH DAM

Bids for six 67,368-kva generators for Chief Joseph Dam have been called by the Corps of Engineers for opening Feb. 1 at Seattle. Award of the contract will bring to 16 the number of generators under construction, 10 presently being under contract. Ultimate installation at Chief Joseph calls for 27 generators, to produce a total of 1,728,000 kw. The initial program calls for installation of 20 generators and one station service bay. First of the six generators is scheduled for delivery by March 1, 1957, with the others to follow at three-month intervals until June 1, 1958. The final generator is scheduled to enter service by Nov. 15, 1958.

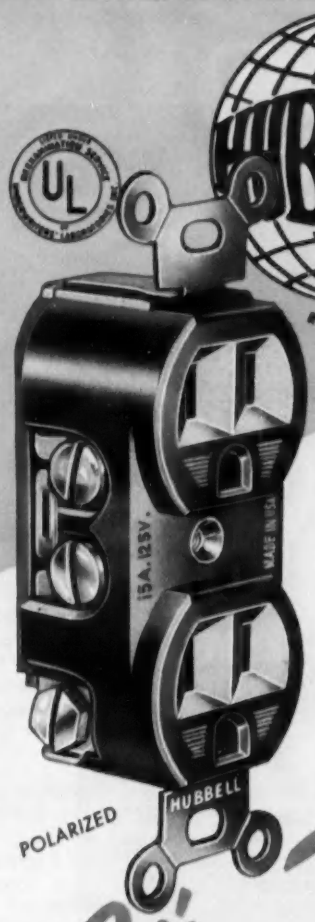
• **Bids** for six main-unit 100,000-hp hydraulic turbine governors and appurtenances for Chief Joseph Dam have been called by the Corps of Engineers for opening Feb. 15 at Seattle. Delivery of the first governor is required by April 1, 1957, with the others to follow at three-month intervals until July 1, 1958.

• **Low bid** for phase II construction for The Dalles Dam power house was $12,661,246 submitted by four firms: C. J. Montag & Sons Inc., Portland; Carl M. Halvorson Inc., Portland; Cascade Construction, Seattle; and Austin Construction Co., Seattle. Bids were opened Dec. 15 by the Corps of Engineers Portland district office.

• **Bonneville Power** Administration reports the offer of F. E. Wilder, Olympia, Wash., for $102,980 was low among six bids for clearing right-of-way and construction of access roads to 6 miles of the Eugene to McKinley transmission line in southern Oregon. The line is scheduled to be energized in 1955 at 115,000 v, later raised to 230,000 v, to tie together the federal system with load centers of the California Oregon Power Co. and southwest Oregon REA co-ops on the Oregon coast.

• **Hitachi Ltd.,** Tokyo, was low bidder at $931,540 for design, manufacture, test and delivery of 14 main turbine-generators and two fish turbine governors for The Dalles dam power house on the Columbia River. Corps of Engineers, Portland district, reported four offers were made for the opening.

• **Platt Electric Supply,** Inc., Portland wholesaler, has been awarded a contract to supply all electric lamps for State of Oregon agencies and institutions during 1955.



For Grounding Exposed Metal Parts of Portable Electrical Equipment

NEW 3-WIRE CONVENIENCE OUTLET

It's Rugged

A competitive, yet highly dependable, duplex flush-mounting receptacle for all practical applications — another example of Hubbell's ability to provide the best in design, materials, and performance even when price is an important consideration. Side-wired with grounding terminal and parallel slots, in brown bakelite and ivorine. Write for full details on its rugged dependability, or see your Hubbell distributor.

FEATURES

- Large-head binding screws for conventional wiring
- Break-off feature for two-circuit installations
- Hexagonal green screw for grounding wire
- Will accommodate two armored or rubber caps
- Slots for 2-wire regular and polarized caps
- U-shaped slot for ground blades
- Washer-type plaster ears
- Wire looping slot

Highest Grade
HEAVY DUTY
WIRING DEVICES

HARVEY HUBBELL, INC.
Write Dept. R-1
BRIDGEPORT CONNECTICUT

3HH55

BIDS RECEIVED FOR GORGE DIVERSION DAM ON SKAGIT

Favorable bids were received by the Municipal Board of Public Works at Seattle for construction of a high diversion dam on the Skagit River at Gorge for City Light. Apparent low bid, in the amount of $14,731,000, came from Merritt-Chapman & Scott of New York and the Savin Construction Corp. of East Hartford, Conn. Cost of the project had been estimated at $17,000,000.

The dam, to supplant an existing low dam, will add some 50,000 kw to the output of the Gorge power house by providing an increased head. City Light specifications call for completion within 1,500 calendar days after award.

Resolutions Adopted by PUD Group at Seattle

At its annual convention in Seattle last month, the Washington PUD Assn. adopted resolutions denouncing the state power commission and recommending that the legislature adopt measures that would confine it to its proper role; reaffirming support of a federal high dam at Hells Canyon; favoring abandonment of the Dixon-Yates contract; urging the federal government to retain full control of atomic energy.

The association also asked the government to begin construction of a major new hydro project in the Pacific Northwest, reaffirmed support of a public regional corporation to develop the Columbia River and opposed an interstate compact.

N. Y. Haskett of Olympia, Thurston County PUD commissioner, was elected president of the association to succeed Dan Jolly of the Franklin County PUD.

Moratorium Asked on Snake Development

Oregon Rural Electric Cooperative Assn. is on record preferring John Day Dam proposal for a new federal project start on the Columbia River and a "moratorium on development of the Snake River between the Nez Perce site and the Hells Canyon site pending the result of further studies." The organization of REA utilities, by resolution at its annual convention last month, declared its "lack of confidence in the so-called partnership power policy." It also expressed friendly interest in the Columbia River Development Corp. and opposition to the proposed Columbia Basin Interstate Compact.

It will ask the Oregon Legislature to establish a committee to "conduct a thorough investigation of the political activities of private utilities in Oregon."

Lee Wooden of Jewell was re-elected president, Edward Collison of Heppner was elected vice-president and Benjamin Little of Condon was re-elected secretary-treasurer.

WORK GOES FORWARD on California Oregon Power Co.'s Lemolo No. 1 project on the upper Umpqua River as U. S. Steel's Consolidated Western Steel Division installs 27-ton steel penstock sections for the dam

Idaho Group Votes To Support Four Northwest Projects

The Second District Wildlife Federation of Idaho has voted to support construction of four Pacific Northwest power projects, including the Mountain Sheep and Pleasant Valley sites on the Snake River.

The two locations are being studied as possible construction sites by four private power firms incorporated as the Pacific Northwest Power Co.

The federation, at its meeting in Lewiston, Idaho, also voted support of the proposed Libby Dam on the Kootenai River in northwestern Montana and a "dam or dams in the Hells Canyon reach" of the river.

• **Initial power generation** at Albeni Falls Dam near Newport, Wash., originally scheduled for Dec. 1, has been postponed because of delays in assembling the 14,000-kw generator. The delay is expected to extend from four to six weeks.

POWER COMPANY CONTINUES CLOUD SEEDING EXPERIMENTS

More cloud seeding experiments will be conducted in three areas of the Sierra Nevada by Pacific Gas and Electric Co., Norman R. Sutherland, vice-president and general manager, announced. Objective will be to increase the winter snowpack to provide additional runoff for hydro plants next summer.

The experiments will be made for the company by North American Weather Consultants of Altadena, Calif., using ground-based silver iodide crystal generators. Results of the first two winter studies, while incomplete, have been sufficiently encouraging to justify continuance of the work, Sutherland said.

Scientists directing the experiments will use mobile radar equipment to monitor cloud movements and precipitation. Seeding will be done under carefully controlled conditions and confined to periods when additional snow can be used beneficially, Sutherland said.

California Engineers Issue Report on Rainmaking

After a three-year study of artificial rainmaking in California, engineers in the state division of water resources have decided that rainfall can be increased by artificial means. They also, paradoxically, have decided that rainfall can be decreased by artificial methods.

The California Legislature in 1951 appropriated $50,000 for the study and since that time engineers of the division of water resources, scientists of the University of California and representatives of the U. S. Weather Bureau have been evaluating rainmaking results in the state.

Their report, which presents detailed analyses of cloud seeding projects in California, finds that certain types of storms have not been affected by seeding. Other types of storms, however, have been modified, with increases in rainfall in some projects and decreases in others.

State Engineer A. D. Edmonston, who has released the report to agencies interested in rainmaking activities, said the study is the most comprehensive analysis of methods of evaluation of weather modification operations yet made.

The report lists all cloud seeding operations which have taken place in California and analyzes the methods of evaluation used.

Here's SPANG® *Quality Control at work... for you!*

These dials, gages and recorded graphs are the story behind SPANG *quality control*. Located beside the heating furnace, they automatically control the furnace heat zones at pre-determined temperatures as *top-quality* skelp is heated prior to the forming and welding of SPANG Conduit.

It's the right combination of controlled gas and pre-heated air entering the various sections of the furnace that produces *top-quality* SPANG Conduit.

and here are the results of Quality Control...

Add to this the fact that each length of SPANG Conduit is especially processed to give it a fine, corrosion-resistant finish . . . is thoroughly tested and inspected to give you a *top-quality* product . . . and you have the complete SPANG *quality-control* story. These quality features make SPANG Conduit easy to work with on the job . . . save you time . . . save you money on installations.

All this means that SPANG Conduit is tops for protecting wiring in all types of electrical installations. You get this *top-quality* in both SPANG Hot-Dipped Galvanized Conduit or in SPANG Black Conduit. Your nearby SPANG Distributor has a complete line of all SPANG Conduit and Fittings. Let him serve you!

SPANG® CONDUIT

SPANG-CHALFANT
Division of The National Supply Company
GENERAL SALES OFFICE:
TWO GATEWAY CENTER, PITTSBURGH, PA.
District Offices and Sales Representatives in Principal Cities

LAST CONCRETE has been poured on Dexter Dam, shown here under construction. The $12,000,000 project, reregulating dam for Lookout Point, is on the middle fork of the Willamette River in Oregon. Its 15,000-kw power house will go into service in April

San Diego Company Asks Rate Increase

San Diego Gas & Electric Co. has filed an application to increase rates by approximately 18%. It expects a PUC hearing to be set for early in 1955 and hopes to place new rates in effect by May 1955.

In a statement issued upon filing of the application, President Emery D. Sherwin said the company's projected earnings for 1955 indicate "a sharp decline to an approximate 4.3%" on capital investment. He said the requested increase would bring the rate of return to 5.9%. A typical monthly bill for residential lighting, refrigeration and small appliances which now amounts to $4.04 would go to $4.49 under the proposed schedule.

Power Profits Decrease Irrigation Costs

Power profits are going to mean lower irrigation costs for Central Arizona landowners under the $5,352,582 budget adopted by the Salt River Valley Water Users Assn.

Cost of irrigation water for this year will be $5 an acre with three acre-ft available. This is a $2 reduction from last year.

Victor I. Corbell, president of the Salt River Project, said the reduction was made possible by application of $991,749 from 1954 power revenues, and a surplus of $290,490 from irrigation operations.

• **Colorado Springs, Colo.,** Department of Public Utilities has asked the city council to approve a 1955 budget that sets an estimated 11% increase in electricity and gas rates to retail customers. Utilities Manager Ted Hohl told the council a long-range projection of income and expenses indicates the costs of all services will advance about 10% in 1955, 1956 and 1957 but would level off after that.

USBR Signs New Contract With Colorado City

Bureau of Reclamation has announced signing of a new contract with the City of Fort Morgan, Colo., for electricity at the rate of approximately 7 mills per kwh.

R. J. Walter Jr., director of the bureau's region 7, said the maximum contract rate of delivery is 5,300 kw. It will be increased to 6,000 kw as soon as additional substation facilities are installed at Fort Morgan. The energy will be delivered to Fort Morgan over the federal interconnected transmission system in the western division of the Missouri River Basin. The new contract will expire Nov. 30, 1974.

It replaces a contract in effect since April 1941.

McNary Fish Facilities Tested by Engineers

A 10-month tabulation of salmon movement over 92-ft high McNary Dam indicates the dam's $22,500,000 fish passage facilities "have justified every expectation of their design," the Corps of Engineers has announced.

The study by corps biologists covers three seasonal spawning runs of 1954 and relates counts at Columbia River's downstream Bonneville Dam, McNary 150 miles upstream and at Rock Island Dam another 150 miles farther upstream.

COLORADO COMMISSION GRANTS SIX PER CENT RETURN

Colorado Public Utilities Commission has authorized a 6% rate of return on investment for Public Service Co. of Colorado. This will permit the company to increase electric rates in 76 Colorado cities to provide $1,529,599 more revenue annually.

PSC's electric operating revenues in 1953, the first year used by the commission in its rate study, were $29,929,009. The company had petitioned the commission last spring for a 6.75% rate of return. That would have permitted it to increase electric revenues $3,879,000 annually, $2,300,000 more than authorized.

The order, at the same time, directed Public Service to cut $961,422 from the gross revenue of its natural gas service and to increase its steam heating service revenues $23,400. The over-all order allows Public Service $591,577 more annually in gross revenues.

J. E. Loiseau, president, said the company was "seriously disappointed" by the order. "We feel the earnings allowed are totally inadequate to meet the increased costs of operation and taxes brought about by inflation, and to compensate for new and additional investment amounting to more than $20,000,000 annually which we have been making in the past and must make in the future," he said. "The over-all net increase of $591,577 amounts, after taxes, to an increase in earnings of less than $300,000."

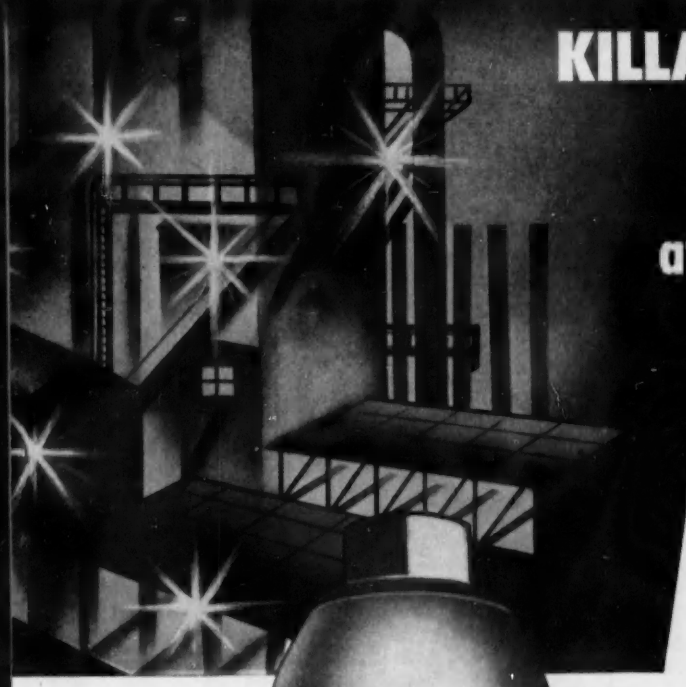
Referring to the electric rate increase Loiseau said, "Since the company voluntarily decreased its electric rates approximately 12% in 1947, the new rates will be substantially lower than prewar rates — notwithstanding the very material inflation which has increased all our costs since then." He added that the company was convinced it must have additional relief "if we are to carry forward our $69,000,000 construction program over the next three years."

PG and E Reduces Rates in Urban Fringe Areas

Pacific Gas and Electric Co. put electric and gas reductions into effect Dec. 1 that are expected to decrease annual gross revenue $568,000. The new tariffs will affect customers mainly in urban fringe areas where increased density of population or annexation by cities warrant lower rates.

The new electric rates will affect some 15,000 customers, resulting in an expected revenue drop of $237,000 annually.

KILLARK *Alumalloy* FITTINGS
Solve Corrosion Problem
at Apex Smelting Company



APEX SMELTING COMPANY
ALUMINUM - MAGNESIUM - ZINC ALLOYS
2501 WEST TAYLOR STREET
CHICAGO 12, ILLINOIS

January 14, 1954

Killark Electric Manufacturing Co.
3940 Easton Avenue
St. Louis, Missouri

Attention: Mr. James Grindell, Sales Manager

Dear Mr. Grindell:

We believe you will be interested in learning of the very excellent results we have experienced using Killark electrical fittings in our operation of a magnesium reclamation and alloying plant. We had encountered serious corrosion problems which were caused by the fluxes and chemicals used, and the nature of these problems was two-fold.

First, there is a combination of sulfur dioxide with moisture in the air to form probably sulfurous acid, together with this, there is present in the room air varying amounts of hydrochloric acid created by hydrolysis of commercial fluxes used with magnesium. These two, while being well below toxic values, cause corrosion to ferrous metals. In addition, the thermal air currents deposit the above mentioned fluxes on structures of all kinds. These materials are hygroscopic, and since they are principally magnesium chloride, they form acid solutions with water from the atmosphere.

As a result of these corrosive actions, we were not able to maintain electric lines in safe operating condition for periods over six months. Conduit, fittings, terminal boxes, pull boxes and attachment screws would all corrode so severely that we would pick up moisture from the surrounding hygroscopic chemicals and short out the lines. This was true with thin-wall and rigid conduit and fittings and with both cadmium and zinc plating and with various types of paints and coatings.

Since applying the Killark aluminum fittings along with aluminum conduit, we have experienced no failures for approximately a year, and upon examination there is no indication that corrosion is progressing. We are confident that we have arrived at a practical solution.

Very truly yours,

APEX SMELTING COMPANY

A. J. Peterson,
Vice-President.

. . . and the next time you make an electrical installation in an industrial atmosphere of corrosive fumes or acids, or one of excessive moisture or humidity — be sure to remember the name KILLARK. You'll be mighty glad (and so will your client) that you allowed for the extra margin of safety and the added years of life that Killark fittings and fixtures offer: they can't corrode — or rust . . . they're made of sturdy, exclusive Alumalloy, the twentieth century metal! Lightweight, too . . . safe and non-sparking . . . roomier for easier splicing.

KILLARK ST. LOUIS

Killark

"Killark . . . a fitting name to remember"

ELECTRIC MANUFACTURING COMPANY

ENTRANCE FITTINGS • CONDUIT BODIES • FLUSH SWITCH FITTINGS • EXPLOSION-PROOF FITTINGS • VAPOR-TIGHT LIGHT FIXTURES • EXPLOSION-PROOF LIGHT FIXTURES • SEALED BEAM FIXTURES

Vandeventer and Easton Aves. St. Louis 13, Missouri

SALES OFFICES and WAREHOUSE STOCKS	ATLANTA	69 Mills St., N.W.	DALLAS	1903 Griffin St.	PHILADELPHIA	2014 Chancellor St.
	BOSTON	49-51 D St.	DENVER	1073 Galapago	PITTSBURGH	50 26th St.
	BUFFALO	278 Johnson St.	DETROIT	8319 Mack Ave.	SAN FRANCISCO	714 Harrison St.
	CHICAGO	1528 West Adams St.	LOS ANGELES	412 Sexton St.	SEATTLE	4130 First Ave., S.W.
SALES OFFICES	BALTIMORE	11 W. 25th St.	COLUMBUS	2700 E. Main St.	MINNEAPOLIS	826 Andrus Bldg.
	CINCINNATI	49 Central Ave.	KANSAS CITY, MO.	616 W. 26th St.	NEW YORK	400 W. 181st St.

CANADIAN REPRESENTATIVES: R. A. Adams, Griffen Sales, Ltd., 188 W. 5th Ave., Vancouver 10, B. C. • A. H. R. Louden Agency, 10547 61st Ave., Edmonton, Alberta • Dave Rycroft, 81 Glenmore Road, Toronto, Ontario • Mackay Morton, 183 James Avenue East, Winnipeg, Manitoba • T. H. Smith & Assoc., 107 Murray St., Montreal 2, Quebec

WESTERN POWER COMPANY WINS SOCRATES AWARD

For the best newspaper advertising among the nation's gas and electric companies, Pacific Gas and Electric Co. won the 1954 Socrates Award. Announcement was made by Vincent Edwards & Co. of New York, which conducts a running review, analysis and rating of utility advertising.

Among reasons given for making the award to PG and E were that the company consistently promotes the use of gas and electric appliances with the needs and benefits of the public as governing factors; that it lays great stress on the advantages of the area it serves; that its advertising ideas are fresh and original; that art, copy and layout are excellent.

Special mention was given to Robert Gros and his staff for their contribution in raising the standards of utility advertising.

Hawaiian Electric Company Grants Wage Increases, Other Benefits

A new one-year contract covering 846 Hawaiian Electric Co. employees was signed by the company and the IBEW, Local 1260. It gives raises ranging from 2c to 7c an hour for electric workers and increases for clerical workers.

Other provisions include a change in pension plan that will cost the company about 4c an hour; a raise in the pay premium for acting foremen from 9c to 11c an hour; a clause setting up training programs for technical and professional employees.

• **California Electric Power** Co. and Local 543 of the International Brotherhood of Electrical Workers, AFL, have signed a new contract for increased fringe benefits, effective Dec. 1. Company contributions to life and medical insurance and workman's compensation will make up the increase, which is equivalent to an average wage boost of nine dollars a month.

• **Joint Crafts Council** at Seattle has rejected wage adjustments ranging to $15 a month offered 2,000 employees of City Light and other city departments for 1955 by the city council. Composed of 21 AFL unions with members employed by the city, the crafts council is attempting to help the city council develop a revenue program to make bigger wage increases possible. Most of the proposed increases would go to drivers, laborers, technical engineers and automobile mechanics.

ALL LIGHTS WERE TURNED ON in Pacific Power & Light Co.'s Portland headquarters building when its new neon sign was inaugurated last month. The neon "spectacular" rolls a white, green and rose curtain behind blinking letters

BPA Has New Office in Interior Building

Bonneville Power Administration opened its new Portland area office in the Interior building, which also houses BPA headquarters, and Administrator William A. Pearl said the office at Eugene will become a district office.

Pearl said the change, previously announced in plans for reorganizing the field office services, would place the area office closer to the seven large industrial customers served by BPA and the three major utilities in the area. The Portland office will be responsible for all operations, maintenance and customer services in southwest Washington and western Oregon. Operation and maintenance staff will occupy the former Vancouver, Wash, district office building.

• **A $300,000 fire** Dec. 2 destroyed the western division warehouse of the Salt River Power District at Phoenix, Ariz. The warehouse, built in 1952, contained power line maintenance and communications equipment. Other divisions of the power district absorbed maintenance work and Victor I. Corbell, district president, said there was no interruption of service.

• **California Oregon Power** Co. has moved its central dispatching office back to Medford, Ore., its headquarters. For 27 years the dispatching office has been at Fall Creek, Calif.

EBASCO OPENS WEST COAST OFFICE IN PORTLAND

Ebasco Services Inc. has opened a Portland office, with William F. Rooney in charge. Other offices are in New York, Chicago, Dallas and Washington, D. C.

According to F. C. Gardner, Ebasco president, the Portland office was opened to acquaint new clients with the firm's services and to facilitate closer relations between its staff and clients in the West.

Rooney, a graduate of MIT, began his career with Boston Edison Co., moved to Western Massachusetts Electric Co. Later he went with the New England division of Westinghouse Supply as merchandise supervisor and then transferred to the appliance department of Westinghouse Electric Corp. He also has served Sylvania Electric Products as special products manager and director of industrial design and the Edwards Co. as administrative assistant to the vice-president in charge of sales. He joined Ebasco in 1950 as a sales consultant and since 1953 has been a new business representative.

Utility Building To Have Community Auditorium

When Utah Power & Light Co. completes its new $400,000 two-story ultra modern office building at Ogden, Utah, next summer, the community will have gained a new auditorium.

Officials of the utility announced that the 200-seat auditorium, equipped with public address systems and facilities for pipe-in closed circuit telecasts, will be open to public use.

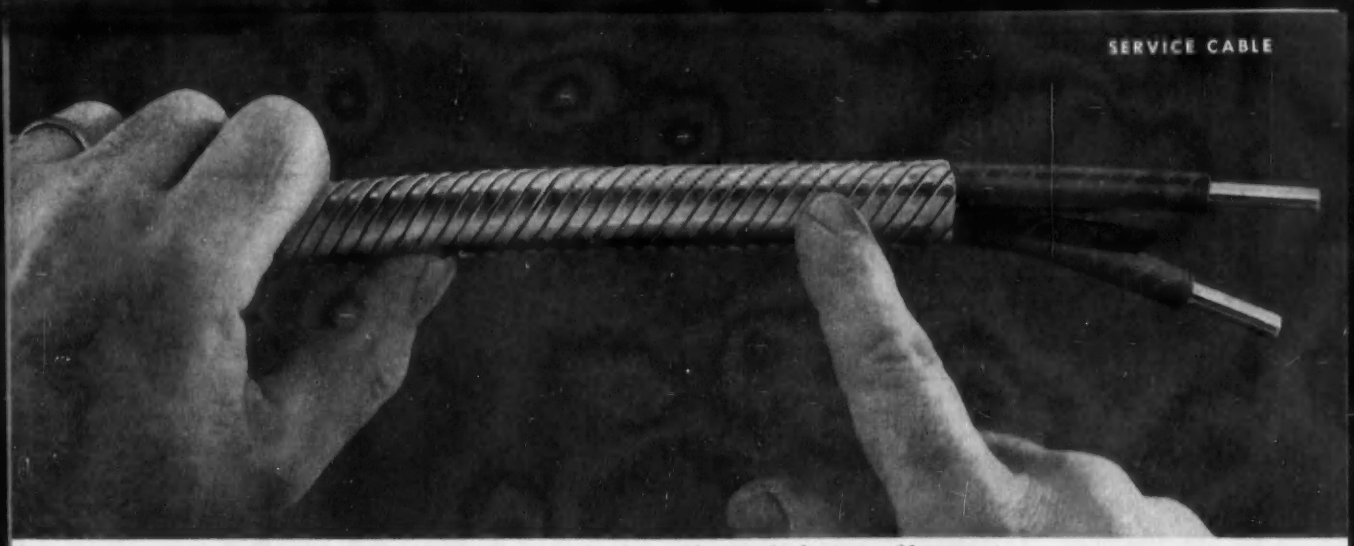
The structure will house Ogden division executive offices, billings, accounting and customer payment departments. The latter includes a drive-in payment window for autoists.

Washington Power Commission Establishes Olympia Office

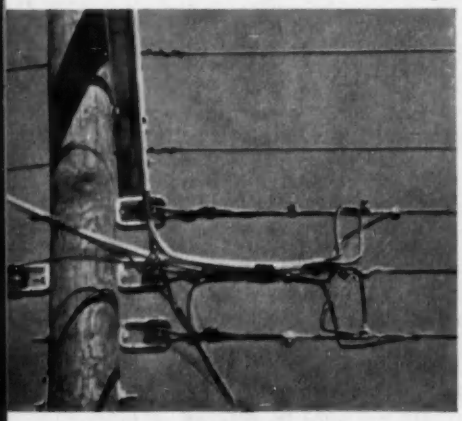
The Washington State Power Commission has opened its principal office in Olympia, appointed an administrative assistant to handle public relations and other duties. Technical office will remain in Seattle.

New administrative assistant is Dan Seymour, Tacoma news and radio man.

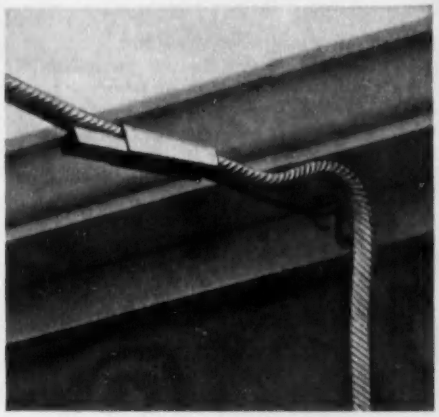
The commission accepted an invitation from the Inland Empire Waterways Assn. to hold a public hearing next spring in Walla Walla.



ANACONDA'S TYPE K service drop cable. Tough aluminum ribbon covering over neoprene-insulated conductors reduces outages caused by foreign objects.



POLE END OF CABLE is deadended with aid of grip attached to secondary neutral bracket by service clevis.



HOUSE END IS ATTACHED by cable clamp and service hook. Type K cable bends without loosening ribbons to provide drip.

DIRECT TO METER. Type K may be installed from pole to outdoor meter without splice or tap where local ordinances permit.

TYPE K SERVICE DROP ASSURES LONG TROUBLE-FREE OPERATION

To help cut trouble calls and costs, Anaconda offers Type K aluminum service drop cable for pole to meter run.

This cable gives long, economical service and reduces outages caused by foreign objects during wet weather.

Conductors of Type K are protected by tough, spirally wrapped flat bare aluminum neutral. This covering helps prevent tree limbs and other foreign objects from chafing through the insulation to the conductors and shorting the line.

Type K cable is light, flexible, easy to install. It is neat. And insulation of specially compounded neoprene gives excellent electrical properties.

Ask your Anaconda Salesman or Distributor for full information today. Or write Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

54087

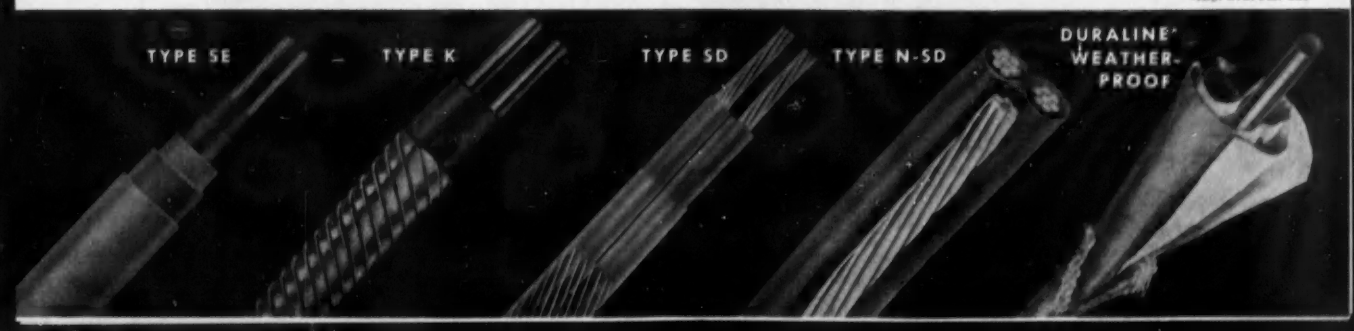
TYPE K service drop cable

ANACONDA®

QUICK SERVICE FOR GROWING WEST — *Anaconda's integrated plant at Orange, California, assures western industry of quick, sure service on wire and cable for every kind of application. Contact Anaconda Sales Office at: Los Angeles, San Francisco, or Seattle.*

Single source for every type service drop and entrance cable — in aluminum and copper

*Reg. U. S. Pat. Off.



NEWS ABOUT PEOPLE

• **Paul P. Ashworth,** general manager of Telluride Power Co., was promoted to the newly created position of executive vice-president, effective Jan. 1. His new duties involve company policy, system planning and power supply. He will continue supervising company operations. **O. C. McShane,** who succeeds him as general manager, will supervise personnel and detailed operations. Both men joined the company as power plant operators, Ashworth in 1906 and McShane in 1916.

• **Whitman Ridgway** has been appointed Pacific district manager of electric utility sales for General Electric Co.'s Apparatus Sales Division, succeeding Marion S. Barnes, who died in November. Ridgway had been coordinator of electric utilities sales activities and, in addition to his regular duties, had been active in recruiting technical graduates from Stanford and UC for G-E's manpower development program. He was graduated from Princeton in 1939 with a B.S. degree in electrical engineering and received his M.S. a year later. He joined G-E in Bloomfield, N. J., in 1940.

• **Appointment** of **Fordys L. Hauser** as steam plant superintendent was announced recently by Reid Gardner, president of the Southern Nevada Power Co. Until the new $6,500,000 steam plant, now under preliminary construction at Whitney, is completed he will work between that site and the company's general offices. Hauser, who retired last April as superintendent, steam plant department, southern division, Pacific Gas and Electric Co., will be the job inspector for the company during construction of the Whitney plant and will take over its operation upon completion.

• **Oliver C. Westberg** was named manager of the Pacific Coast division of Benjamin Electric Mfg. Co., succeeding **Carl O. Martin.** Martin has retired from full-time duty but will continue as a special representative. Headquarters are at San Francisco.

• **R. E. Roberts,** formerly of General Cable Co., San Francisco, has been transferred to Seattle, where he will become manager of that branch.

• **Appointment** of **William K. Body,** assistant chief engineer in charge of refrigeration and air conditioning for Thermador Electrical Mfg. Co., was announced by W. E. Cranston, president. He has been with Kelvinator.

• **Charles K. Massey** has been made Pacific Coast industrial heating sales engineer for Westinghouse Electric Corp. His office will be in the company's regional headquarters in San Francisco.

• **Thomas R. Lawson** has been appointed sales manager for the Sunnyvale plant of Westinghouse Electric Corp. He comes from the company's headquarters at Pittsburgh, where he was assistant sales manager of industrial products.

• **R. T. Enloe,** superintendent of Southern California Edison Co.'s northern hydro generation division, has been appointed assistant superintendent of the company's hydro generation division. He has been stationed at the company's Big Creek, Calif., office. **R. B. Cowdon,** formerly Enloe's assistant, will succeed him and will himself be succeeded by **H. L. Wheeler Jr.,** formerly Enloe's administrative assistant. **L. W. Wood,** station chief at power house No. 1, will succeed Wheeler.

• **Sol E. Schultz,** former chief engineer of Bonneville Power Administration from 1940 until he resigned in June, has been appointed by H. Zinder & Associates, utility consultants with headquarters in Washington, D.C., to head a new regional office in Portland, Ore. The Portland office will serve the entire Pacific Northwest area.

• **Joseph H. Liebrich,** service sales representative for Pacific Power and Light Co., has been promoted to the post of residential sales manager, Northwestern division, succeeding **James Buman,** retired.

• **Col. John A. Graf,** assistant district engineer at Portland, has been promoted to head the San Francisco district of the Army Corps of Engineers, replacing **Col. Andrew J. Goodpaster** Jr., recently named Pentagon-White House liaison officer.

• **Paul Wayne, 78,** general counsel for Public Service Co. of Colorado, died Nov. 28 at Glockner-Penrose Hospital in Colorado Springs. He was formerly a member of the board of directors of the power company.

• **E. W. Michael,** one of the organizers and former president of the Verde River Irrigation and Power District in central Arizona, died on Dec. 3.

Now—
good service insurance for electric utilities—

ELECTRO-MOBILE POWER

HERE'S A NEW, low-cost safeguard of the dependable, adequate power supply for which electric utility companies are noted.

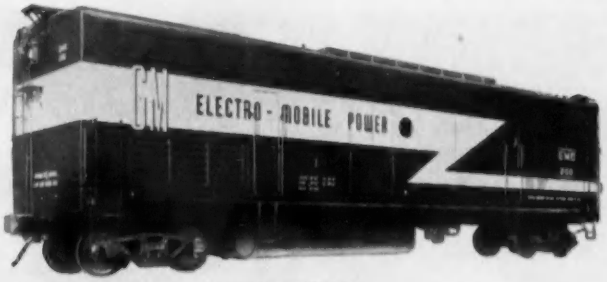
These two types of mobile generating units can be moved by rail or highway to the point of need—and then, following a simple connection, supplementary power of any desired amount can be on the line within 45 seconds!

For fringe area boosting, for peak skimming, for emergency use or temporary demand, these products of General Motors' Electro-Motive Division provide a flexible, economical tool.

These units, completely self-contained, can be fully automatic in operation. They offer the most advanced electrical engineering, equipment and controls, plus the well-proved dependability of a famous Diesel engine.

Mass-produced on the long-established lines of Electro-Motive Division's specialized plants, their cost is unprecedently low. Servicing facilities are nationwide. And the equipment investment is protected by a modernization program that prevents obsolescence.

We invite the inquiries of any electric utility company interested in service expansion.

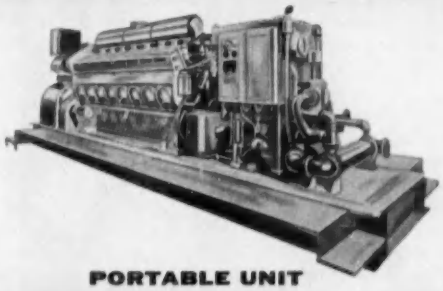


RAIL UNIT

1,000 and 750 kw. units for use on sidings, or placed on piers for semi-permanent use.

TRUCK UNIT

500 and 350 kw. capacities to move on highways to desired sites.



PORTABLE UNIT

1,000, 750, 500 and 350 kw. capacities for permanent or semi-permanent installations.

ELECTRO-MOBILE POWER FEATURES INCLUDE:

- Remote control starting and stopping
- From starting to full load within 45 seconds
- Automatic synchronization with line in phase, frequency and voltage
- Full protective equipment, including 3-phase surge capacitors, lightning arresters, over-current relays, field failure relay
- Complete self-operation can be provided
- Ability to meet higher capacity needs by unit multiplication
- Complete national parts and service availability

ELECTRO-MOTIVE DIVISION
GENERAL MOTORS
La Grange, Illinois

Sold and serviced directly through a manufacturer's organization. Electro-Motive Division offices in: New York City, Chicago, Jacksonville, St. Louis and San Francisco.

NOTES ON THE TRADE

Western Firm Announces Organizational Changes

Organizational changes in Maydwell & Hartzell Inc., effective Jan. 1, elevate Fred A. Mulvany to the position of president and general manager. Harry F. "Pop" Hartzell, majority stockholder, becomes chairman of the board and will continue active in directing the general policies of the company.

D. P. Cady is the new vice-president and general field sales manager of the company.

"Pop" Hartzell organized the M&H firm in 1923. Prior to that he was with Baker Joslyn Co. of San Francisco. Mulvany joined M&H in 1939 after having served as sales manager for Leo J. Meyberg. Prior to that he had been with Pacific States Electric Co. and RCA. Cady has been associated with M&H about 20 years.

The firm has moved its San Francisco office and warehouse into new quarters at 870 Tennessee St.

Hartzell

Mulvany

• **Raymond K. Leonard** has been appointed manager of the South Pacific lamp sales district for Westinghouse Electric Corp. The district includes southern California, the State of Arizona and Las Vegas, Nev. Leonard joined Westinghouse in 1945, after 20 years in the electrical contracting and appliance businesses. He was transferred to Los Angeles from Dallas, where he had been manager of Texas district sales.

• **Bernard C. West,** formerly sales manager for Pacific Oerlikon in Tacoma, Wash., has joined Federal Pacific Electric Co. in Seattle as apparatus engineer, working under direction of **Charles H. Cutter,** manager. Cutter reports that **Bradford J. Stimpson,** Seattle Federal Pacific apparatus salesman for two years, has been transferred to Portland as branch manager.

• **Headquarters** for Region 1, Motorola Communications and Electronics Inc., are being moved to Portland from San Mateo, Calif. **Donald F. Brickley,** zone manager for northern Illinois, has been named manager of Region 1, covering Washington, Oregon, Montana, Idaho, Wyoming, Utah and eastern Nevada. Northern California, formerly part of Region 1 will be served by the Los Angeles office.

• **Irvin H. Webster** has been appointed operations manager of General Electric Co.'s recently announced Electronic Communications Center in Redwood City, Calif. The center was scheduled to be ready for business by Jan. 1, 1955. The new unit will serve as the West's principal outlet for G-E communications equipment, according to I. M. Ellis, Western regional manager for the company's Radio Communication Equipment Department.

• **Eichorn & Melchior** have been appointed San Francisco representatives for the Feedrail Corp. of New York, manufacturer of industrial trolley busway electrification systems. They will cover northern California counties and parts of Nevada. Offices are at 500 Minnesota St., San Francisco 7, Calif.

• **George Hunsinger** has been appointed engineer of wires and cables by Western Insulated Wire Co. of Los Angeles, manufacturer of Bronco products. He has been in the wire and cable field for 20 years, will be in charge of design, development, research and quality control of large, flexible neoprene-jacketed cables.

• **Robert E. Thomas,** partner of Delius & Thomas, electrical and mechanical engineers of San Francisco, and **James B. Wilson,** engineering partner of Law & Wilson, architect-engineers of Honolulu, last month announced association of the two organizations in the field of electric power generation, transmission and distribution as well as other specialized electric and mechanical projects.

• **Campbell & George Co.,** manufacturers' representative, will move to new quarters at 1601 Cortland Ave., San Francisco, on Jan. 24. The firm is northern California representative for the Allen-Bradley Co., the Automatic Control Co., Eagle Signal Corp., Roller-Smith Corp. and others. The new quarters will give improved facilities for serving its customers, according to H. E. Campbell.

• **Micro Switch,** division of Minneapolis-Honeywell Regulator Co., has opened a research and product development center in Denver. Located at 387 Corona St., the new center will supplement activities of the main office in Freeport, Ill. **Wilbert Martin,** assistant director of product research and development, will be in charge and about 10 engineers and technicians will be employed.

• **Minneapolis-Honeywell** Regulator Co. has purchased the assets of Heiland Research Corp. of Denver, maker of precision scientific instruments. The Denver firm will be operated as a Honeywell division.

• **Consolidated Western Steel** Division of U. S. Steel Corp. will build a steel pipe manufacturing plant near Provo, Utah. The 117-acre site is across the street from the Geneva Works of the Columbia-Geneva Steel Division. The new Utah plant will replace line pipe facilities at South San Francisco, Berkeley and Los Angeles. Other production at the California plants will continue.

• **A Certificate of Achievement** for "outstanding leadership, service and integrity in the merchandising of electrical time switches," has been awarded to South Gate Wholesale Electric Co. of Los Angeles by the International Register Co. of Chicago.

Rigid testing of *Explosion-Proof* CONDULETS*

assures safety and long dependable service

Crouse-Hinds extensive laboratories and modern manufacturing combine to give you top quality

Laboratory testing is one of the key operations in the production of electrical equipment of the highest quality. Crouse-Hinds laboratories are equipped with the latest scientific instruments and staffed with expert technicians.

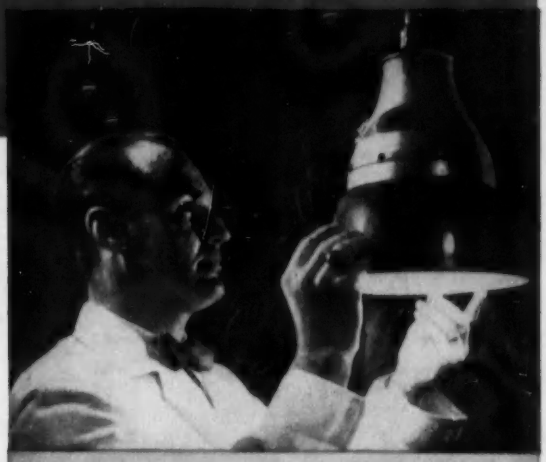
Products are constantly tested to make sure that they are being made to withstand field conditions. New devices are tested to predetermine their meeting or surpassing the requirements of Underwriters' Laboratories.

The photographs at the right show three of the many testing operations that are done in the Electrical Laboratory. It is equipped with apparatus for making both alternating and direct current tests, heat tests, pressure tests and many others.

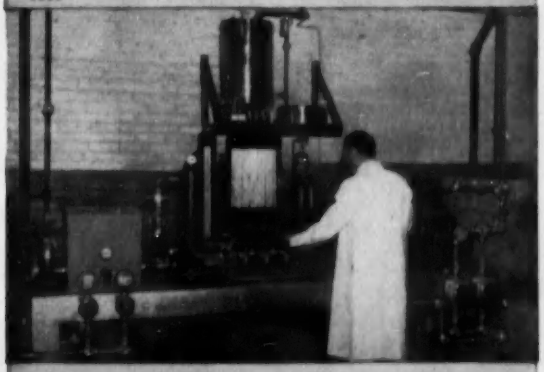
Close cooperation between Crouse-Hinds laboratories and manufacturing departments is one of the reasons why Condulets have been the "Standard of Quality" for nearly fifty years.

Specify CONDULETS on every job. They're made right... to serve you better... and last longer.

When quality counts ... you can count on Condulets



Probing for maximum exterior operating temperature on a Type EVA Explosion-Proof Lighting Fixture using a multiple point recording potentiometer.



Adjusting carburetors and flow meters to create a predetermined explosive mixture within an explosion-proof Condulet for an explosion test.

Photographing the pressure wave in the Oscilloscope to determine the maximum explosion pressure within an explosion-proof Condulet that is behind the concrete wall.

CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

OFFICES: Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas — Denver — Detroit — Houston — Indianapolis — Kansas City — Los Angeles — Milwaukee — New Orleans — New York — Philadelphia — Pittsburgh — Portland, Ore. — San Francisco — Seattle — St. Louis — St. Paul — Tulsa — Washington. RESIDENT REPRESENTATIVES: Albany — Atlanta — Baltimore — Charlotte — Corpus Christi — Reading, Pa. — Richmond, Va. — Shreveport. Crouse-Hinds Company of Canada, Ltd., Toronto, Ont.

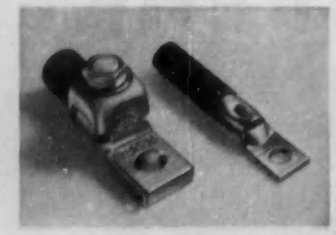
CONDULET — First in the field — STANDARD OF QUALITY

*CONDULETS are made only by CROUSE-HINDS

A Nationwide Distribution Through Electrical Distributors

CONDULETS · TRAFFIC SIGNALS · AIRPORT LIGHTING · FLOODLIGHTS

For Industrial Wiring . . .



BURNDY
Clamp & Compression Connectors

Offer rapid, efficient means of terminating cable in all industrial applications. Hylugs and Qiklugs provide permanent, low-resistance joints—quickly, easily, economically.

For detailed information write

GEO. E. HONN CO.
420 Market St., San Francisco
SUtter 1-7352

Kresich

Waterbury

• **Formation** of Steber Mfg. Co. of California has been announced by C. L. Steber, president of Steber Mfg. Co. of Broadview, Ill. A new plant is being built for the company at 242 S. Anderson St., Los Angeles 33, with 24,000 sq ft of manufacturing and storage facilities. **John Kresich** has been appointed sales manager. **Paul Waterbury** is special sales representative and lighting specialist. **Gordon Dean** is chief engineer, **Charles Richardson,** production manager, at the plant.

• **R. M. McCandless** has joined Henry R. Bente & Associates, consulting engineers, of 3128 N. Del Mar Ave., San Gabriel. McCandless was with General Electric Supply Co. for nine years.

DIRECTORY ADDITIONS CORRECTIONS

Manufacturers' Directory

BARTLETT MANUFACTURING CO., 3003 E. Grand Blvd., Detroit, Mich.—Tree Trimming Equipment, George E. Honn Co., 420 Market St., San Francisco, Ralph E. Bishop, 130 S. Bright St., Whittier, Calif.; Metal Cutting Shears, Hughson and Merton, 1270 Bush St., San Francisco, 3209 Glendale Blvd., Los Angeles, 910B Elliott Ave. West, Seattle, and 509 Beason Bldg., Salt Lake City.

STRENGTH, ENDURANCE that Meet the Test!

Crapo
Guy and Messenger Strand

IN THE FIELD as in laboratory tests . . . *Crapo* Galvanized Steel Strand proves itself capable of withstanding severe punishment. Steel's inherent strength and durability are combined with definite economies in every size and grade of *Crapo* Steel Strand. You'll find the heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

Contact your jobber of *Crapo* Galvanized Products or write direct for further information!

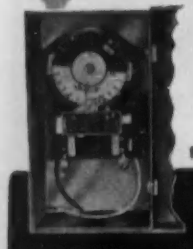
INDIANA
STEEL & WIRE COMPANY
MUNCIE, INDIANA

SAVES YOU MONEY
DAY-IN DAY-OUT
TORK
ASTRONOMICAL CONTROL

Now ready, as a kit, to fit any regular model on the job. Simple to change. Saves time—Saves money.

ON AT SUNSET—OFF AT SUNRISE or a fixed time, 10:30 p.m. to 1:30 a.m.

• Tork Time Switches require no attention—this feature $12.00. A must on all public safety lighting. An economy on all commercial lighting. Tork is fully automatic. No one forgets.



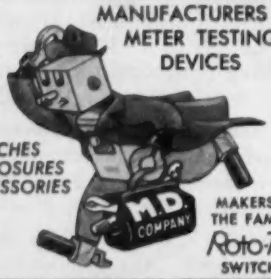
PLAY SAFE—USE THE BEST

Stocked in L.A.–S.F.–SEATTLE

TORK CLOCK CO.
One Grove Street Mount Vernon New York

LARGEST EXCLUSIVE MANUFACTURERS OF METER TESTING DEVICES

SWITCHES
ENCLOSURES
ACCESSORIES



MAKERS OF THE FAMOUS Roto-Test SWITCHES

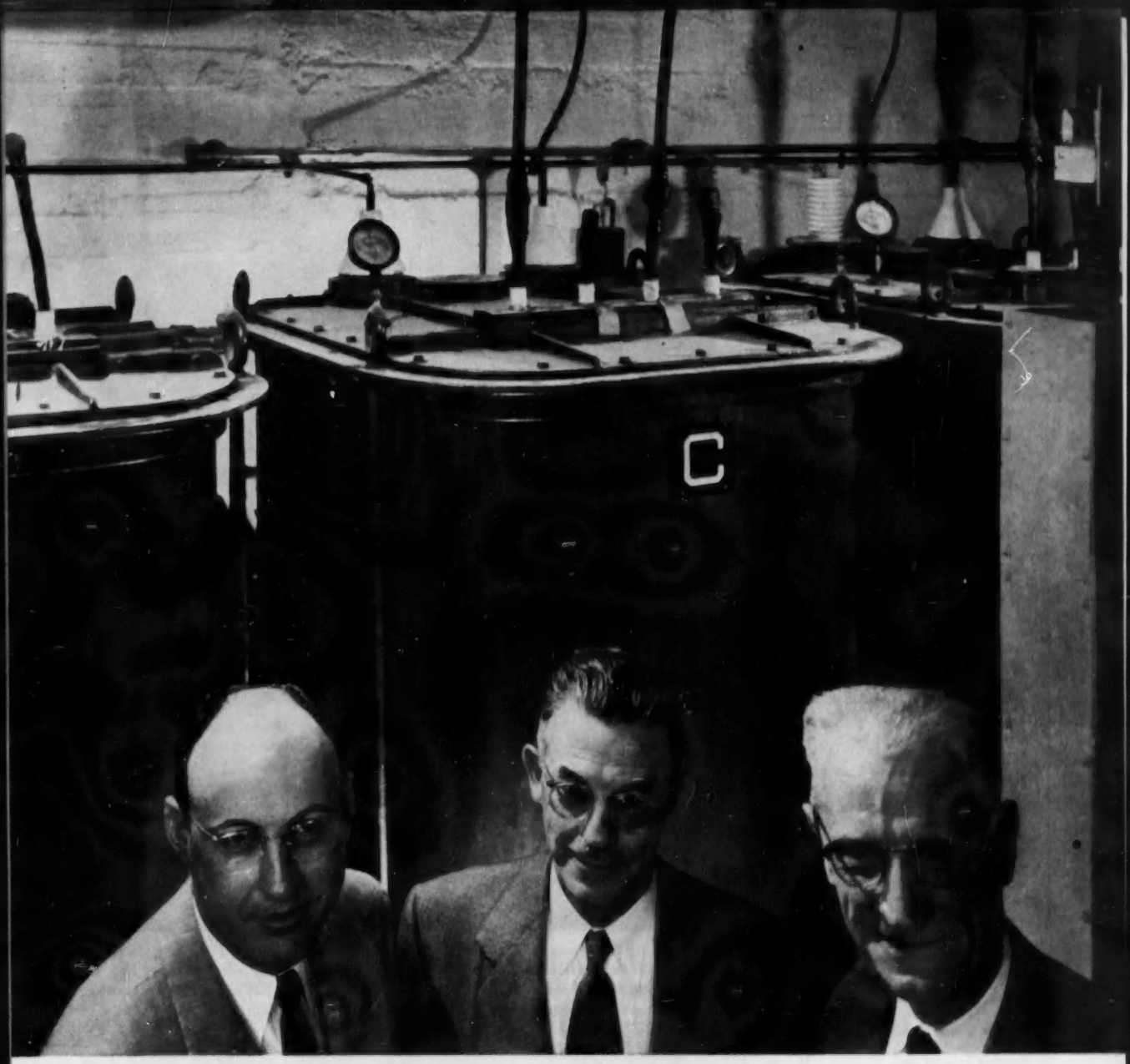
METER DEVICES
COMPANY • CANTON, OHIO

TRANSFORMERS

We manufacture Power, Distribution, Dry Types and specials of all kinds.

Also rewinding, redesign, general service and repair.

EXPERIENCED • DEPENDABLE
HILL TRANSFORMER COMPANY
1030 Washington St., San Carlos, California



LIFE BEGINS AT 52

Here's the winner, and its finders*, in General Electric's Treasure Hunt for America's oldest operating G-E transformer in the ASA range of ratings. This 52-year-old veteran is an 1100-kw, 30,800-volt, water-cooled transformer built by Stanley Electric, founder of G.E.'s plant in Pittsfield, Mass. It was installed early in 1902 by California Gas and Electric, later merged into the Pacific Gas and Electric Company. For more than 19,000 days, almost half a million hours, it has faithfully carried load with only routine maintenance. Now this old-timer gets a well-deserved rest and immortality (on a pedestal at G.E.'s Rome, Ga. plant), while P. G. & E. gets a brand new G-E Repetitive-Manufacture transformer. General Electric Co., Schenectady 5, N. Y.

*Messrs. H. P. Braun and H. T. Sutcliffe of Pacific Gas and Electric with F. S. Glassier of General Electric. 421-52

Power Transformer NEWS

Progress Is Our Most Important Product

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

INDEX TO ADVERTISERS
January 1955

Allen-Bradley Company 37, 38
Allis-Chalmers Mfg. Co. 6, 7, 13, 59, 109
American Tel & Tel Co. 31
Anaconda Wire & Cable Co. 129
Anderson Brass Works, Inc. 54

Benjamin Electric Mfg. Co. 26
Brewer-Titchener Corp. 15
Briegel Method Tool Co. 47
BullDog Electric Products Co. 33

Chance Company, A. B. 9
Cole Electric Company 138
Columbia-Geneva Div. U.S. Steel Corp. 5
Crouse-Hinds Co. 133

Driver-Harris Company 113
Duncan Electric Mfg. Co. 23

Electro-Motive Div. General Motors Corp. 131

G & W Electric Specialty Company 57
General Electric Co.:
Schenectady, Apparatus Div. 10, 11
17, 18, 19, 20, 34, 35, 44, 45, 60, 135
Greenlee Tool Company 42

Hill Transformer Co. 134
Honn Co., George S. 134
Hubbell, Inc., Harvey 123

Indiana Steel & Wire Co. 134

Kaiser Aluminum & Chemical Corp. 27
Kearney Corp., James R. 40, 41
Killark Electric Mfg. Co. 127
Klein & Sons, Mathias 56
KPF Electric Company 28
Kuhlman Electric Co. 121

Lapp Insulator Co., Inc. 48, 49
Line Material Company 3
Locke Dept. General Electric Co. 4

McGraw-Hill Book Company 52
Marlow Lights, Inc. 117
Maydwell & Hartzell, Inc. 116
Meter Devices 134
Moffett Engineering Co. 116
Moloney Electric Co. 29

National Tele Supply Co. 16

Ohio Carbon Company 46

Pacific Coast Electrical Association ..... 4th Cover
Pacific Gas and Electric Co. ..... 3rd Cover
Paranite Wire & Cable Div. 21
Pennsylvania Transformer Co. 51
Porcelain Products, Inc. 50
Preformed Line Products Co. 39
Pyle-National Co. 122

Rockbestos Products Corp. 22
Rome Cable Corp. 110, 111

Sangamo Electric Co. 43
Simplex Wire & Cable Co. 53
Smith Company, S. Morgan 8
Smoot-Holman Co. 1
Soapstone Duct Company 137
Southern California Edison Co. ..... 2nd Cover
Spang-Chalfant Div., National Supply Co. 125
Square D Company 119
Sunbeam Lighting Co. 12

Triangle Conduit & Cable Co., Inc. 114, 115
Tork Clock Co. 134

United States Rubber Co. 24, 25
United States Steel Corp. 5
Union Insulating Co., Inc. 130

Victor Insulators, Inc. 55

Westinghouse Electric Corp. 95, 96, 97
98, 99, 100, 101, 102, 103, 104, 105 106

Youngstown Sheet & Tube Co. 14

PROFILES

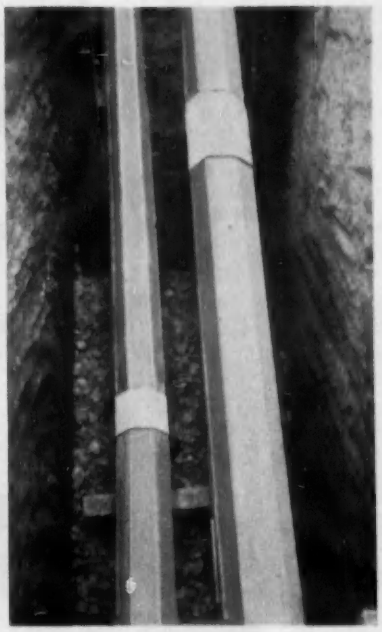
Wesley Jacobsen, Petaluma, Calif., one of six national winners in the 4-H electric program, shown with his first advisor, George E. Silva. Since his first assignment, an electrician's tool box, four years ago, the 16-year-old boy has had an outstanding record, which this year won him an expense-paid trip to the 4-H Club Congress in Chicago (as California State winner) and top award of a $300 college scholarship from the Westinghouse Educational Foundation. The West was well represented at the Chicago congress, with nine state winners, including Wesley Jacobsen, among the 43 attending

The Okonite Co., formerly headquartered in the Russ building, San Francisco, dedicated its new office and warehouse building at 701 Phelps St. with a housewarming party Dec. 16. I. W. Borda, vice-president, was host. Among the guests were, left to right, Fred Hanson, Frank Tracy, Ken Ryals, Dean Cady, Pop Hartzell. Borda is at the right of the sign

New team at T. L. Rosenberg Co., with Leon Hampton of Longview, Wash., taking the helm as president. With him are Roy Brockman, vice-president and general manager; Walter Smithen, vice-president and chief engineer; Elmer Lago, sales engineer; and Ed Jaffe, secretary-treasurer. Not in the picture are also numbered Ken Moyle, shop manager; Harold Wolf, senior sales engineer; and John Cain, lighting sales engineer

Groundwater was a problem on this underground system . . .

Future roads made special reinforcing necessary . . .



Power and telephone circuits ran in the same trench . . . but

RIGID SPECIFICATIONS WERE MET OCT-O-DUCT HELPED

The contractor on this underground job at a new college campus at Goleta, California, had plenty of construction problems.

Excessive groundwater made it necessary to pump many trenches, put a premium on fast duct erection and encasement.

Built to Last

A steel reinforcing web was devised to strengthen duct-beam where future roads would impose heavy loading.

Combined Circuits

Many thousand feet of OCT-O-DUCT were laid, combining 3-inch and 4-inch in the same trench to accommodate power and telephone circuits.

The exclusive features of Soapstone OCT-O-DUCT helped make it possible to meet the rigid specifications called for on this job, despite problems encountered.

OCT-O-DUCT is designed to take complicated set-ups and unusual construction problems in stride. Flat sides, simple couplings and convenient length make it first choice with contractors and construction departments of power and telephone utilities, and industrials throughout the West.

Low Price

OCT-O-DUCT's low price and low installation cost, combined with its outstanding electrical, chemical and mechanical characteristics, give you your best buy in underground circuit protection. Try O C T - O - D U C T on your next underground job.

Write for specification bulletin bulletin 54A and for Installation Manual 54B.

SOAPSTONE DUCT COMPANY

110 Linfield Drive, Menlo Park, California

Distributed in the West By

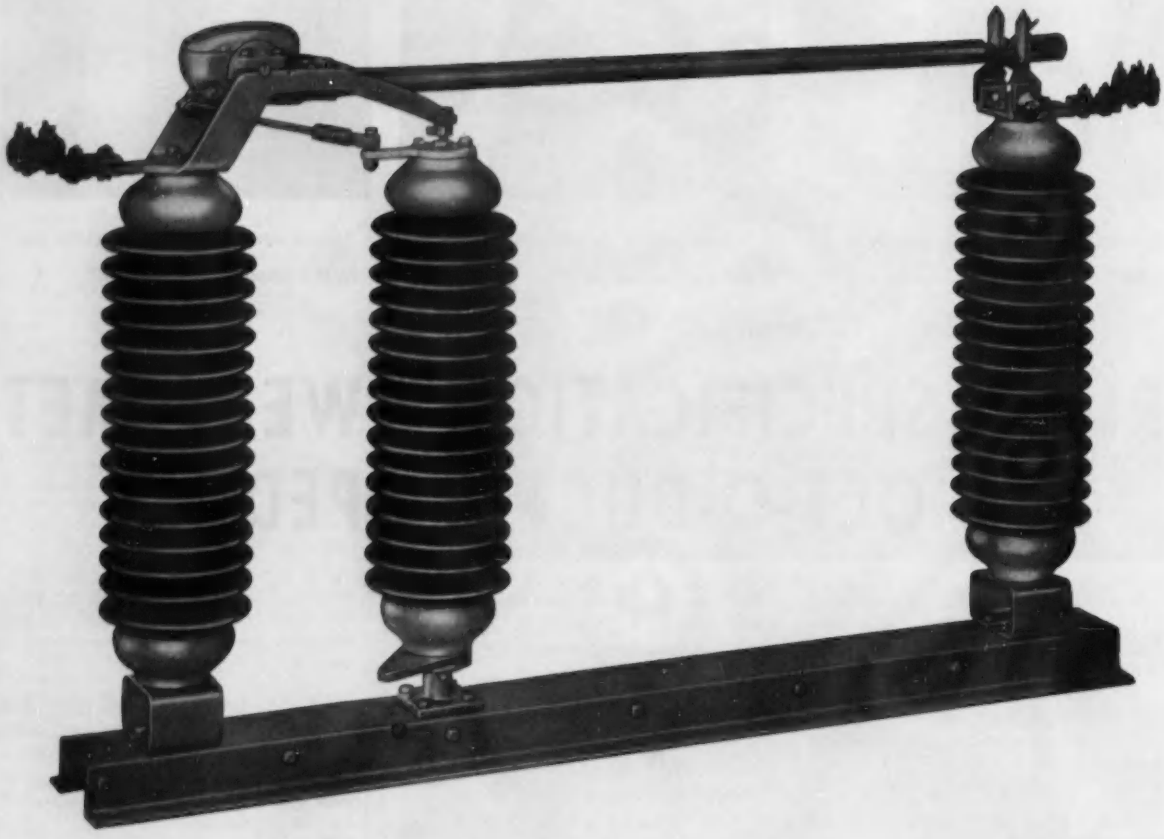
MAYDWELL & HARTZELL, INC.

San Francisco · Los Angeles · Phoenix

Portland · Seattle · Spokane

Cole Electric Co.

5428 Stoller Drive TExas 0-4701 Culver City, Calif.



AIR BREAK DISCONNECTING SWITCH
69,000 Volts—600 Amperes
Type O-2
Vertical Break, Three Pole, Single Throw
Group Operated—One Pole Shown
HIGH PRESSURE SILVER TO SILVER CONTACTS
See Bulletin 46-A

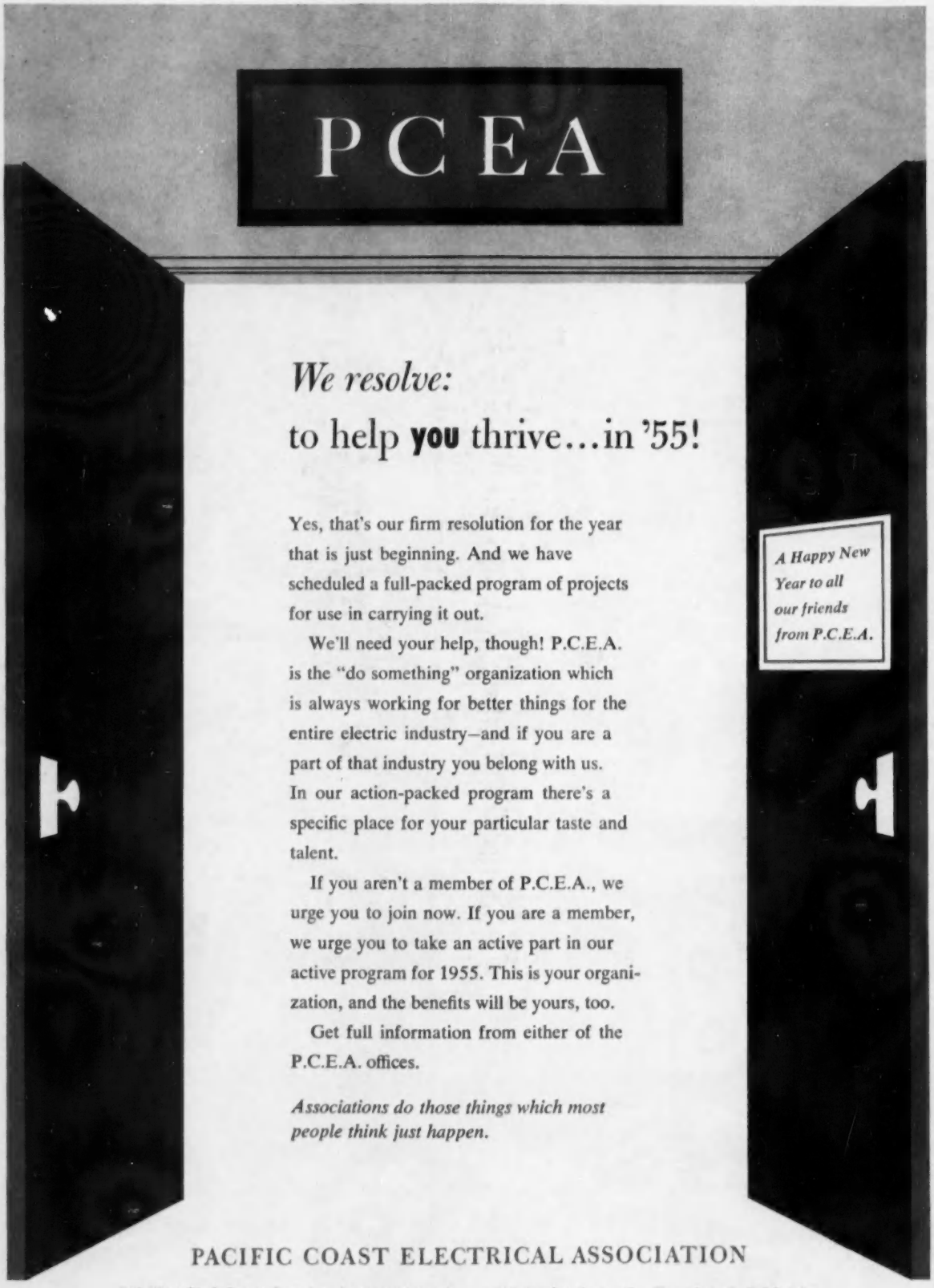
chill cheater!
electric
heater!
"This added-on room was hard to heat ...'til we got our electric heater!"
says Mrs. Robert Mau, 26 Park Avenue, Mill Valley, California
(shown here with four of her eight children, Steve, Mary Louise, Chuck and Louise)
"When we added this combination utility-play-guest room to our house, it couldn't be connected to the central heating system. But a modern electric heater solved our cold-room problem in a hurry. We get instant heat—exactly the degree we want—automatically. "We're so pleased, we're having a complete electric heating system installed throughout the new vacation house we're building."
Whether you need instant heat for a hard-to-heat room—or a completely new heating system throughout your home—electric heating provides the modern, completely automatic way to get all the warmth you want. Electric heat is clean, draft-free, with no heat wasted. For complete details, see any qualified, experienced, electrical contractor or dealer, or your local P. G. and E. office, today!
P·G·E
completely automatic way to heat a cold room
Here's the modern way to bring new comfort to any room that's hard to heat! Today's perfected electric heating provides exactly the degree of warmth you want, automatically—with no heat wasted. Electric heating is clean, quick, draft-free—easy and comparatively inexpensive to install.
There are many attractive designs to choose from: built-in or portable unit heaters (with or without fans); baseboard panel heating, built-in or portable glass panel heaters, ceiling or floor panels.
Properly installed in an insulated room, the cost of electric heating is reasonable. Any experienced, qualified electrical contractor or dealer will be glad to survey your home. Without obligation, he'll tell you what it will cost to install a well-engineered electric heating plan.
Take full advantage of California's low-cost electricity. See your dealer, contractor, or P. G. and E. today—about automatic electric heating for that hard-to-heat room in your home!
Electricity is cheap in California!
P·G and E
Pacific Gas and Electric Company

PROMOTION NEWS from P. G. and E.

This month, Northern and Central Californians will read these P. G. and E. promotional advertisements. And when Californians buy and use more modern appliances, everyone profits . . . in business, in industry, in the home. For P. G. and E.'s low-cost gas and electricity can thus do more work, provide more of the comforts of life.

701-AX-155

Gas and electricity are cheap in California



We resolve:
to help **you** thrive...in '55!

Yes, that's our firm resolution for the year that is just beginning. And we have scheduled a full-packed program of projects for use in carrying it out.

We'll need your help, though! P.C.E.A. is the "do something" organization which is always working for better things for the entire electric industry—and if you are a part of that industry you belong with us. In our action-packed program there's a specific place for your particular taste and talent.

If you aren't a member of P.C.E.A., we urge you to join now. If you are a member, we urge you to take an active part in our active program for 1955. This is your organization, and the benefits will be yours, too.

Get full information from either of the P.C.E.A. offices.

Associations do those things which most people think just happen.

A Happy New Year to all our friends from P.C.E.A.

PACIFIC COAST ELECTRICAL ASSOCIATION

530 West Sixth Street, Los Angeles 14, California 681 Market Street, San Francisco 5, California